decided to analyze the rate of progression of CKD in a population followed by a multidisciplinary team.
Methods: We analyzed data from 209 patients (102 females) referred to the Nephrology Division, after at least 6 months under treatment by a multidisciplinary team (nephrologist, nutritionist, nurse and psychologist) patients were followed from January of 2002 until December of 2005. Glomerular filtration rate was estimated by MDRD equation (eGFR). Patients with eGFR below 15ml/min were excluded, and this value was considered the end-point for calculation of the rate of decline of renal function. Results are mean± SD.
Results: Hypertension was the main cause of CKD (31%) followed by Diabetes (26%). Age was 60±15 years, body mass index was 27±5 kg.m^2 for females and 26±4 kg.m^2 for males. Serum calcium, phosphorus and albumin were normal. Urea was 71±36mg/dl, eGFR = 38±20 ml/min. Systolic arterial pressure was 137±20mmHg and diastolic= 80±11mmHg; hematocrit = 37±5%, hemoglobin =12.3±1.7g/dl; cholesterol= 194±42mg/dl, HDL-cholesterol= 36±11mg/dl, LDL-cholesterol= 119±54mg/dl; triglyceride = 167±106 mg/dl; iPTH= 221±221 pg/ml.
From the studied population 58% was referred to treatment with eGFR = 45-30 ml/min, and the remaining with eGFR =29 to 15 ml/min.
K/DOQUI suggests a decline of 4ml/min/year for CKD patients. As shown in Table1, the rate of decline of eGFR of the present population was below this level, meaning an extra gain of time per year free from dialysis as a consequence of the conservative management with a multidisciplinary team.

Table1. Progression of CKD

Baseline disease	Initial eGFR (ml/min)	GFR reduction (ml/min/yr)	Time expectancy in conservative management (yrs)	Time gain/year in conservative management (yrs)
Diabetes	40.48	2.88	8.85	0.62
Hypertension	35.41	0.89	23.05	0.78
Others	46.21	1.23	25.42	0.69

Conclusions: The present data show that a late referral population, did not show complications of uremia, and the rate of decline of GFR was lower than suggestted by K/DOQUI. We concluded therefore that, if followed by specialists and if possible by a multidisciplinary team, retarding the progression of CKD even in its more advanced stages is possible. Therefore conservative management is an efficient way to maintain CKD patients and to postpone renal substitutive therapy. Finally we believe that programs aiming this treatment should be encouraged to ameliorate care of CKD patients.

Epidemiology of CKD 1

FP158 ETHNIC DIFFERENCES IN PREVALENCE OF HEMATOLOGICAL AND METABOLIC ABNORMALITIES BY GFR STAGE

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Introduction and Aims: Biochemical and hematological abnormalities increase in severity and prevalence by stage of GFR. The evidence to date is based on NHANES data from a US cohort of white, black and Hispanic ethnicities. Using a provincial database in which all patients referred nephrologists are registered when GFR< 60ml/min, we undertook to describe the prevalence of abnormalities by ethnicity within different levels of GFR.
Methods: British Columbia is a population of 4 million people, with mixed ethnicities including Caucasian, Oriental Asian, South Asian and First Nations individuals. Between 2000 and 2006, we examined a registered cohort of 5968 pts who had GFR < 60 ml/min/1.73 m^2, to determine the prevalence of abnormalities in hemoglobin, calcium, phosphate, iPTH, albumin and bicarbonate at the time of registration. Cut-off-points were selected based on the lower or upper limit of the lab normal range. GFR was calculated using the abbreviated MDRD formula, and using categories of <15, 15-30, 30-45 and 45- 60 ml/min.
Results: The mean age of our cohort was 66; 57% were male, and 38% were diabetic. The proportion of patients within each category of GFR was similar by ethnicity: Caucasian 65-77%, Asian Oriental 8-17%, South Asian 7-10%, Other 3-6%. Table 1 describes the prevalence (%) of abnormalities of hematological and metabolic abnormalities by ethnicity and level of GFR. Note that there is statistically different prevalence of abnormalities within stages of GFR between Caucasians and Asian Orientals in particular.

Table 1. Prevalence of hematological and metabolic abnormalities by ethnicity and GFR level

	GFR Level	Caucasian	Asian Oriental	South Asian†	Others
N		4301	820	552	295
Age (yrs)		67±15	67±16	60±17	56±18
Male (%)		59	52	54	51
Diabetes (%)		38	28	47	46
GFR		26.5±13.1	22.7±12.2	24.1±13.2	23.6±13.8
HG<120 g/L	[45 - 60)	31	51*	43	30
	[30 - 45)	39	49*	48	59
	[15 - 30)	52	58*	63	61
	<15	64	64	55	60
CA<2.1	[45 - 60)	8	15	2	21
	[30 - 45)	6	15*	7	17
	[15 - 30)	13	21*	16	28
	<15	14	25*	16	35
PO4>1.4	[45 - 60)	14	19	20	30
	[30 - 45)	18	32*	29	30
	[15 - 30)	35	42*	49	47
	<15	57	55	59	57
iPTH>6.8	[45 - 60)	39	53	47	48
	[30 - 45)	53	53	79	67
	[15 - 30)	66	62	76	69
	<15	65	74	79	71
ALB<35 g/L	[45 - 60)	16	23	12	27
	[30 - 45)	15	20*	13	33
	[15 - 30)	23	32*	32	37
	<15	42	44	25	45
HCO2<20	[45 - 60)	2	4	2	3
	[30 - 45)	6	7	6	17
	[15 - 30)	9	10	11	17
	<15	13	13	16	15

†Asian Indian and Filipino; *indicates statistically significant compared to Caucasian

Conclusions: This is the first report of differential prevalence of well-known renal associated abnormalities by ethnicity within a patient cohort in a universal access health care system. Improved understanding of these differences are important in order to understand the pardoxical finding of better prognosis for Asian Orientals on dialysis. These findings indicate that this occurs in spite of worse metabolic and hematologic abnormalities at earlier stages of CKD. Questions around race specific GFR and related laboratory test cut-offs should be pursued.

FP159 ★ PREDICTORS OF NEW-ONSET KIDNEY DISEASE IN A GENERAL MIDDLE-EUROPEAN POPULATION

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Introduction and Aims: Established cardiovascular risk factors are associated with end-stage renal disease (ESRD) with hypertension and diabetes being the leading causes. The aim of this study was to identify risk factors at an earlier stage of kidney disease with the belief that interventions could prevent or delay the progression to ESRD as well as cardiovascular disease. Predictors of new-onset kidney disease have not been thoroughly studied.
Methods: Since 1990 the general population of Vienna was invited to yearly preventive medical checkups within the ongoing Vienna Health Study. Until 2005, 24.689 apparently healthy volunteers (44% women, age range 20-84 years, men 20-89 years) could be assessed longitudinally. They performed a baseline examination at any time within the study period and were subsequently invited to a follow up examination once a year,

but no preset time intervals for the follow up examinations could be demanded imperatively. Within the follow up period, there were a mean of 3.09 individual follow up examinations performed, each individual's mean follow up period was 5.66 years and the mean longest follow up period was 7.44 years. Primary outcome of interest was the development of kidney disease defined as a decrease of glomerular filtration rate (GFR) < 60 ml/min/1.73m^2 (calculated by the abbreviated Modification of Diet in Renal Disease (MDRD) -equation) at the follow up examinations. Covariates included age, sex, GFR, body mass index, sports (endurance exercise ≥ 2 times/week), smoking status, total-, HDL-, LDL-cholesterol, triglycerides, uric acid, fasting serum glucose, systolic and diastolic blood pressure, diagnosis of hypertension categories, and diabetes mellitus. A multivariable logistic generalized estimating equations model (taking into account the dependence between repeated measurements within the same individual at different follow up periods) was performed with respect to statistical significance resulting from univariate analysis of the covariates adjusted for age and sex. Variables were retained if Wald tests gave a $P < 0.001$.

Results: The following parameters presented as odds ratios (OR) with 95% confidence intervals predicted new-onset kidney disease: Age (increase of 5 years), OR=1.35 (1.33 to 1.37); sex if female, OR=1.91 (1.70 to 2.16); MDRD-GFR ≥ 90 ml/min/1.73m^2 vs. 60-89 ml/min/1.73m^2, OR=0.54 (0.50 to 0.73); sports, OR=0.64 (0.57 to 0.73); smoker, OR=1.69 (1.54 to 1.85); ex-smoker, OR=1.38 (1.22 to 1.56); uric acid (increase of 2 mg/dl), OR=1.71 (1.60 to 1.83); hypertension stage 1, OR=1.78 (1.60 to 1.99); hypertension stage 2, OR=2.28 (1.99 to 2.61); diabetes mellitus, OR=1.52 (1.11 to 2.10).

Conclusions: Established cardiovascular risk factors predicted new-onset kidney disease. The impact of sex should be interpreted retentive, since sex appears in the numerator of the MDRD-equation. Higher GFR at baseline and sports were revealed as probably protective.

FP160 CHRONIC KIDNEY DISEASE AND MORTALITY AND MORBIDITY AMONG PATIENTS WITH ESTABLISHED CARDIOVASCULAR DISEASE: A COMMUNITY-BASED COHORT STUDY

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Introduction and Aims: The importance of chronic kidney disease as an independent risk factor for morbidity and mortality in patients with cardiovascular disease in the community is not widely recognised.

Methods: A retrospective cohort study based in the West of Ireland followed a randomised practice-based sample of patients with cardiovascular disease. A database of 1,609 patients with established cardiovascular disease was established in 2000. This was generated from a randomised sample of 35 general practices in the West of Ireland. The primary end point was death from any cause. The secondary endpoint was a cardiovascular composite endpoint which included death from a cardiovascular cause or any of the cardiovascular events of myocardial infarction, heart failure, peripheral vascular disease and stroke.

Results: Of the original community-based cohort of 1,609 patients with cardiovascular disease, 1,272 (79%) had one or more serum creatinine measurements during the study period and 31 (1.9%) patients were lost to follow-up. Median follow-up was 2.90 years (SD 1.47) and the risk of death from any cause [total of 214 deaths] was significantly increased in those patients with reduced estimated GFR (glomerular filtration rate) [Log Rank (Mantel-Cox) 56.97, $p < 0.000$] as was the risk of the cardiovascular composite endpoint (Log Rank (Mantel-Cox 26.74 $p < 0.000$). For every 10ml decrement in estimated GFR there was a corresponding 33% increase in relative risk of death from any cause and a corresponding 20% increase in relative risk of the cardiovascular composite endpoint.

Conclusions: Estimated GFR appears to discriminate prognosis between patients with established cardiovascular disease. These results emphasise the importance of recognising chronic kidney disease as a significant and potentially modifiable risk factor in patients with cardiovascular disease in the community.

FP161 SYSTEMATIC ESTIMATION OF GLOMERULAR FILTRATION RATE IN PRIMARY CARE PATIENTS AND ITS INFLUENCE IN NEPHROLOGY REFERRAL

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Introduction and Aims: Chronic kidney disease (CKD) is becoming a public health burden. The ageing population and the epidemic of type 2 diabetes are the main causes. Early detection of renal dysfuntion is critical to its clinical management. Many factors affect serum creatinine concentration so creatinine-based equations are recommended to estimate glomerular filtration rate (GFR). The aim of this study was to know the number of CKD patients attended in primary care and the influence of systemic GFR estimation in nephrology referral.

Methods: This is a six months descriptive study. GFR was estimated using the modified MDRD formula in all primary care patients over 18 years living in the reference area of our Hospital, in who serum creatinine concentration were asking for their primary care doctor. Kidney function was classified by the K/DOQI stages. We also examined cholesterol and haemoglobin levels, as well as the presence of hyperglycaemia when were available.

Results: GFR was estimated in 16167 analysis. GFR <60mL/min/1.73m^2 was present in 1254 analysis from 1094 patients (6.8% of total analysis), 70.7% women. These patients aged 40 to 98 years (mean 77±9), serum creatinine was 1.3±0.6 mg/dL and GFR 48.5±10 mL/min/1.73m^2. According to K/DOQI stages, 93% were at stage 3, 6.5% at 4 and 0.5% at 5. Glycaemia >126 mg/dL was found in 18.5% and >100 mg/dL in 10.4%, LDL-cholesterol levels >100 mg/dL was present in 54.6% and anemia (haemoglobin <13 g/dL in men or <12 g/dL in women) exist in 20.9% of patients with GFR <60mL/min/1.73m^2.

131 patients (12%) were nephrology referral during the study period or 3 months later. Referred patients versus non-referred patients characteristics are showed in Table 1.

Referred patients versus non-referred patients data

	Referred patients (n=131)	Non-referred patients (n=963)	p
Age (years)	73.5±9.7	77.4±8.8	<0.0001
Sex (%women)	50.4%	73.5%	<0.0001
Creatinine (mg/dL)	1.68±0.72	1.29±0.52	<0.0001
GFR (mL/min/1.73m^2)	41.3±11.8	49.5±9.3	<0.0001
Cholesterol (mg/dL)	189.9±49.4	199.8±42.3	0.042
LDL-c (mg/dL)	110.3±42.5	115.9±35.9	NS
LDL-c <100 mg/dL (%)	33.6%	27.9%	0.01
Diabetes mellitus (%)	19.1%	18.4%	NS
Haemoglobin (g/dL)	13.1±2	13.5±1.7	0.03
Anemia (%)	38.4%	18.6%	<0.0001

Data are mean ± SD, except where specified. NS: not significative. Anemia was defined as haemoglobin <13 g/dL in men and <12 g/dL in women.

Conclusions: In our primary care population, we found a prevalence of CKD near 7%, mostly women aged 70 to 80 years. Patients with GFR <60mL/min/1.73m^2 have a high prevalence of hypercholesterolemia and anemia, and 18.5% were diabetics.

Only 12% of patients with CKD were nephrology referral. This patients were younger, present lower GFR with higher creatinine levels and worse control of LDL-cholesterol and anemia than non-referred.

So we thought GFR estimation improved nephrology referral.

FP162 ★ DIFFERENTIAL ASSOCIATION OF METABOLIC SYNDROME (MS) AND CHRONIC KIDNEY DISEASE (CKD) BETWEEN MEN AND WOMEN IN KOREA: RESULTS FROM KOREAN NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (KOREAN NHANES)

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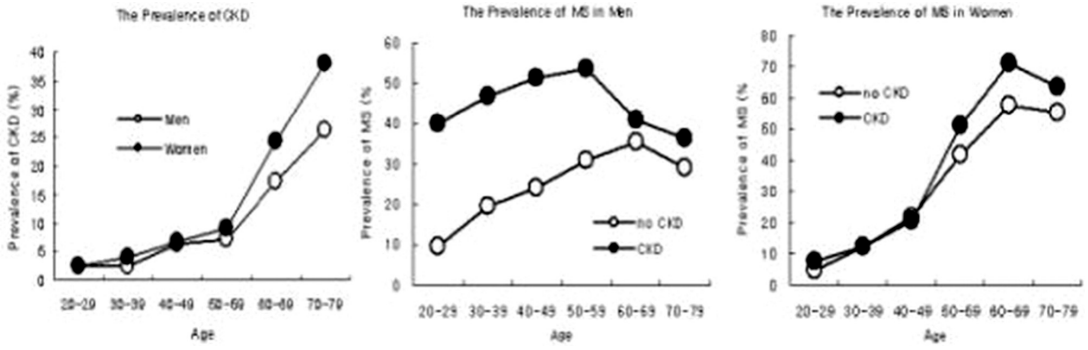
Introduction and Aims: Both MS and CKD are the major international



Abstract FP162 – Fig. 1

health problem. Although MS is known to be strongly associated with CKD in several cohort studies from different countries, it is not known which components of MS are more important than others for the development of CKD or which host factors play a significant part in the relationship between MS and CKD. To better understand the complex interrelationship between MS and CKD, we performed a cross-sectional study in non-institutionalized Korean civilian using the data of Korean NHANES in 2001. The Korean NHANES is a health survey of a nationally representative sample of the Korean population.

Methods: Of 7,918 participants, 5,491 at age between 20 and 79 years were available for analysis for the prevalence of CKD (defined as dipstick proteinuria or a reduced GFR less than 60 ml/min per 1.73m^2 by MDRD formula). MS was diagnosed by NCEP-ATP III with the Asia-Pacific abdominal obesity criteria (90 cm for men, 80 cm for women).

Results: The prevalence of CKD was in 8.7% of subjects (7.2% in men and 9.9% in women) and MS was seen in 25.7% (24.4% in men and 26.8% in women). The prevalence of CKD increased with age, especially in 60 years of age and over sharply in both genders. Although MS was a significant determinant of CKD in entire subjects [OR=1.68 (95% CI 1.36-2.09), p=.000], subanalysis revealed that it was only significant in younger men (<60 years) [OR=2.49 (1.50 to 4.12, p=.000) in men<60, OR=1.04 (0.59 to 1.82, p=0.89) in men≥60, OR=1.09 (0.69 to 1.72, p=0.73) in women<60, OR=1.44 (0.95 to 2.17, p=.08) in women≥60]. This finding suggested that MS was no more a significant determinant of CKD after age of 60 despite a high prevalence of MS per se in this age group. Among five risk factors of MS, all five components affected CKD in men<60 years [impaired fasting glucose: OR=3.08 (1.94 to 4.89, p=0.000), high TG: OR=2.69 (1.71 to 4.25, p=0.000), hypertension: OR=2.65 (1.70 to 4.11, p=0.000), central obesity: OR=2.41 (1.54 to 3.77, p=0.000), low HDL: OR=1.67 (1.08 to 2.58, p=0.02)] whereas only central obesity, hypertension and high TG related to CKD in women<60 years [central obesity: OR=1.60 (1.13 to 2.27, p=0.008), hypertension: OR=1.80 (1.22 to 2.66, p=0.003), high TG: OR=1.50 (1.02 to 2.20, p=0.04)].

Conclusions: Metabolic syndrome was a significant determinant of CKD in younger subject (<60 years), not in elderly population. In men, all five risk factors of MS were important, but in woman, only central obesity, hypertension and high TG were significant risk factors for CKD. In elderly population, not MS but aging and other risk factors may take more important part in the development of CKD.

FP163 UROTENSIN II IS AN INVERSE PREDICTOR OF DEATH FROM ALL CAUSES AND CARDIOVASCULAR EVENTS IN CHRONIC KIDNEY DISEASE STAGE 2-5

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Introduction and Aims: Urotensin II (UTN) is a cyclic vasoactive undecapeptide highly represented in multiple organ systems, including the kidney and the cardiovascular (CV) system. Plasma levels of UTN are much increased in end-stage renal disease (ESRD). However, despite its vasculotoxic potential in animal models, higher plasma UTN predicts longer survival in dialysis patients. We sought to determine if this same association exists in earlier stages of Chronic Kidney Disease (CKD) studying an incident cohort of 122 clinically stable pre-dialysis patients.

Methods: Linear models were used to study the associations of UTN with baseline characteristics, renal function, traditional and non-traditional CV risk factors including homocysteine and acute phase reactive proteins, and previous history of CV disease (coronary artery, peripheral or cerebrovascular disease, or heart failure). Cox's regression was used to model time-to-death as a function of UTN considering the same covariates for adjustment plus a time-varying variable indicating progression to ESRD (progressed to ESRD vs. never/not yet progressed). Two separate models were built with either time-to-death from all causes or fatal CV events as outcomes.

Results: Mean age at enrolment was 71±11 years, 64% of patients were men, 24% diabetics and 58% had clinical CV disease. No correlation was found between baseline GFR (mean 32±15 ml/min/1.73 m^2) and plasma UTN (mean 5±3.6 ng/ml). In this cohort, plasma UTN (median 4.4 ng/mL, inter-quartile range: 2.0-7.4 ng/mL) was significantly higher (P<0.01) than that in healthy subjects (median 2.8 ng/mL, inter-quartile range: 1.9-4.6 ng/mL). In adjusted analysis UTN correlated directly with serum albumin (1.66 ng/ml per g/dL, P=0.004) and inversely with pre-existing coronary artery disease (-1.66 ng/ml, P=0.01). During a mean follow-up of 41 months, 43 patients died, 29 from CV events. After adjusting for potential confounding factors, increased UTN similarly predicted lower risk for death from all and CV causes (Hazard Ratio 0.88; 95% Confidence Intervals 0.80-0.97). Both models included C-Reactive-Protein, previous history of CV disease and the time-varying indicator of progression to ESRD as direct predictor of death. None of the other clinical characteristics, comorbid conditions, nontraditional and traditional CV risk factors considered were significant at the two-tailed level of 0.05 or modified the regression coefficient of UTN.

Conclusions: In patients with moderate to severe CKD plasma UTN is an inverse predictor of overall and CV mortality. Our findings confirm data observed in ESRD and suggest that UTN should not necessarily be viewed as a vasculotoxic peptide in CKD patients.

FP164 ★ CLINICAL PREDICTORS OF ATHEROSCLEROTIC RENOVASCULAR DISEASE IN PATIENTS UNDERGOING CARDIAC CATHETERIZATION

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Introduction and Aims: The clinical diagnosis of atherosclerotic renal artery stenosis (RAS) remains problematic because its clinical manifestations are not specific. Fortuitous diagnosis of RAS has become commonplace. The aim of our study was clinical detection and severity determination of RAS in a high cardiovascular risk population, referred for diagnostic or therapeutic cardiac catheterization.

Methods: From April to December 2006, all consecutive patients (pts)

undergoing non-emergent cardiac catheterization at a single institution were also evaluated for atherosclerotic RAS by renal angiography. Clinical, laboratory and angiographic data were recorded. Pts enroment will end by April 2007.
Results: We studied 682 consecutive pts who underwent coronary angiography and renal arteriography (age 63±11 yr, M 494 F 188, sCr 1±0.3 mg/dl, CrCl 87±31 ml/min, Diabetes 36%, Hypertension 87%, Hyperlipidemia 75%). In the aggregate, 49 patients out of 682 (7%) had a significant RAS (>50%) and 505/682 (74%) had at least 1 coronary vessel involved (1 vessel in 172 cases, 2 vessels in 168 cases and 3 vessels in 165 cases). On univariate logistic regression analysis, RAS was significantly associated to the severity of CAD [n of coronary vessel involved (P<0.001)], history of peripheral vascular disease (P<0.001), CrCl (P<0.001), serum creatinine (P<0.001), history of chronic renal insufficiency (P<0.001), hyperlipidemia (P=0.007), pulse pressure (P=0.008), age (P=0.01), systolic pressure (P=0.03), and BMI (P=0.05). No significant association was found between renal artery stenosis and sex, smoking and diabetes. In a multiple logistic regression model, including all univariate correlates of RAS, serum creatinine [odds ratio (OR) (1 mg/L increase): 6.95, 95% CI: 3.19-15.16, P<0.001], peripheral vascular disease (OR: 2.75, 95% CI: 1.38-5.49, P=0.004), hyperlipidemia (OR: 3.00, 95% CI: 1.03-8.77, P=0.04) and number of involved coronary vessels [OR (1 stenotic vessel increase): 1.39, 95% CI: 1.02-1.89, P=0.04] maintained an independent association with RAS. In a ROC curve analysis serum creatinine, peripheral vascular disease, hyperlipidemia and number of involved coronary vessels jointly produced a ROC curve area of 78.8% (95% CI: 72.2-85.4%, P<0.001). In this analysis, the contribution of the number of involved coronary vessels to identify RAS was very low (2.4%). Accordingly, the estimated probability of significant RAS, adjusted for the above mentioned significant covariates, associated with 0,1,2,3 CAD-vessels was 3%, 4%, 6% and 8%, respectively.
Conclusions: In a population at high risk for cardiovascular disease, not previously suspected of having RAS, the latter is associated with simple and readily determined clinical and laboratory characteristcs. These data may facilitate the selection of patients who may have to undergo to diagnostic renal angiography procedures.

FP165 MORTALITY RISK FOR PATIENTS RECEIVING HEMODIAFILTRATION VERSUS HEMODIALYSIS: RESULTS AT TWO YEARS FROM THE RISCAVID STUDY

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Introduction and Aims: RISCAVID (Cardiovascular risk in dialysis) study is an observational and prospective study of the over 800 patients in hemodialysis and peritoneal dialysis of the north-west part of Tuscany. This population is rather peculiar because hemodiafiltration (HDF) is largely used for renal replacement therapy (44%). Characteristics and outcomes at two years were compared for patients receiving HDF versus HD.
Methods: The study followed 757 patients stratified into three groups: standard bicarbonate HD (n.424), and low- (n.205) and high-efficiency HDF (n.128). At the time of the enrolment demographic, clinical and laboratory data of the whole population were registered as well as co-morbidity conditions established by anamnestic and instrumental information. The population was followed up for 24 months reporting overall mortality, CV mortality and CV major non fatal events (acute myocardial infarction, stroke and ictus). Cox proportional hazards regression assessed adjusted differences in mortality risk.
Results: Patients receiving standard HD had an higher incidence of diabetes (21.6% vs 16.4% low-eff. HDF vs 16.0% high-eff HDF); patients receiving low and high-efficiency HDF had significantly longer average duration of end-stage renal disease (6.5 and 6.3 versus 5.3 years), patients receiving high-efficiency HDF had significantly more hypertension (60 versus 45% low-eff HDF).No significant differences were observed in received single-pool Kt/V (1.40 vs 1.43 vs 1.40). High-efficiency and low-HDF patients had lower crude mortality rates than standard HD patients. After adjustment, high-efficiency and low HDF patients had a significant lower mortality risk than those receiving standard HD (relative risk=0.78, P=0.01).
Conclusions: These observational results at two year from the RISCAVID study confirm recent findings that HDF may improve patient survival independently of its higher dialysis dose.

FP166 IDENTIFYING INDIVIDUALS WITH CKD: ARE WE OVERESTIMATING THE NUMBER?

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Introduction and Aims: Chronic kidney disease (CKD) is becoming increasingly common in the community as a result of our ageing population and rising incidence of diabetes. In recognition of this the Quality Outcomes Framework for CKD has been developed allowing us to identify "at risk" individuals at a much earlier stage and target management strategies. Despite this, little is known about the epidemiology and natural history of early CKD, particularly disease progression, and precisely what impact these individuals will have on the health service.
We aimed to establish with increased accuracy the prevalence and severity of CKD in a selected population with at least one abnormal creatinine in North-East Scotland.
Methods: In a linked study we identified 5751 patients with at least 1 creatinine ≥150umol/l (males) and ≥130umol/l (females) in a 6 month period using the single laboratory that serves Grampian (pop.500,000). Using the criteria of 3 abnormal creatinines, at least one month apart, revealed that 2315 had CKD. 474 had ARF and 88 ACRF using ADQI definition. 1918 patients, however, could not be classified. 1405 of these have been analysed to date. All available creatinines (median N=27) were converted to eGFR using the abbreviated MDRD formula. eGFRs were grouped into 3 time periods: Index, Previous and Future. Using median eGFR values patients were grouped according to their likelihood of having CKD. The breakdown of groups are as follows: Unlikely n=80 (5%), Uncertain=245 (17%), Probable n=933 (66%), insufficient data n=147(10%). The presence of markers of kidney damage, co-morbidities and outcomes were identified from case note review.
Results: The median age was 78 and 80 for males and females respectively. Median eGFR was 33.4 for females and 38.7 for males. Those in the "at risk" group were initially staged according to their index eGFR. Markers of kidney damage determined from case note review allowed a further 61 patients to be staged (994 in total). Of these, 82% are in Stage 3, 17.7% Stage 4 and 0.3% in Stage 5. Hypertension and ischaemic heart disease were the most common co-morbidities. Mortality in Stage 3 was 45% at 30-36 months. Median survival from time of index was 1.4 years for Stage 4 and 0.4 years for Stage 5. 131 patients in the "at risk" group without markers were classed as having no definite evidence of CKD (5% of 1405). The remaining 336 patients had insufficient data for classification (25% of 1405).
Conclusions: The majority of patients with at least one elevated creatinine (70%) in this study have evidence of CKD. This predominantly elderly population if referred to the renal services are likely to utilise a significant proportion of our health care resources. On the other hand a substantial minority (30%) have no conclusive evidence of CKD. These patients may have been included in other prevalence studies thus overestimating the prevalence of CKD.

FP167 ★ CLINICAL AND BIOCHEMICAL IMPLICATIONS OF LOW THYROID HORMONE LEVELS (TOTAL AND FREE FORMS) IN CKD STAGE 5 PATIENTS

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Introduction and Aims: Chronic kidney disease is a non thyroideal illness, and it has been recently suggested that low levels of free triiodothyronine (fT3) could be associated with pathological conditions and maladaptation leading to decreased survival rather than a sign of physiological adaptation

to energy shortage. In the present study, we explore and compare the association of decreased thyroid hormone levels (total and free forms) with inflammation, wasting and survival in patients with end-stage renal disease (ESRD).
Methods: This is a *post hoc*, cross-sectional study including 210 ESRD stage 5 patients close to the start of dialysis therapy, with a follow-up of up to 60 months. Biochemical measurements of total and free forms of thyroid hormones, s-albumin, hs-CRP, plasma interleukin (IL)-6, soluble vascular adhesion molecule-1 (sVCAM-1), insulin-like growth factor 1 (IGF-1) and 8-hydroxy-2'-deoxyguanosine (8-OHdG) were performed.
Results: Multivariate analysis according to receiver operating characteristic (ROC) curves, showed that among the hormones studied (total and free forms), mortality was best predicted by total triiodothyronine (T3). When using the cut-off levels derived from ROC, low T3 levels were associated with increased inflammation (higher concentration of hs-CRP, IL-6 and sVCAM-1), increased oxidative stress (higher concentration of 8-OHdG) and wasting (lower concentration of s-albumin and IGF-1). Finally, low T3 was associated with worse all-cause (Likelihood ratio= 35.9; $p<0.0001$) and cardiovascular mortality (Likelihood ratio= 37.6; $p<0.0001$) after adjustment for age, gender, presence of diabetes mellitus and inflammation.
Conclusions: This study shows that low thyroid hormone levels are associated to increased inflammation, wasting and oxidative stress markers in ESRD patients. This study is also able to compare and propose for the first time, T3 levels as a more sensitive prognostic factor than fT3 of not only all-cause but also CVD mortality in ESRD patients. Altogether, the present study supports the hypothesis that thyroid dysfunction is implicated in the high mortality risk of the ESRD population.
Supported by an ERA-EDTA grant.

FP168 CEREBROVASCULAR DISEASE HAS INCREASED PREVALENCE IN PRE-DIALYSIS CHRONIC KIDNEY DISEASE PATIENTS

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Introduction and Aims: Stroke represents an entity of major clinical and epidemiological importance with regard to cardiovascular complications in patients (p) with chronic kidney disease (CKD).
Methods: The aim of the study was to evaluate retrospectively the incidence of ischaemic stroke in pre-dialysis CKD p within a 5-year follow-up period and to assess potentially conducive factors. A group A of 180 p with CKD and ischaemic stroke recorded out of 2465 p with CKD [males- 100p (55.6%), females- 80p (44.4%), mean age- 65.64±10.92 years] and a gender- and age- matched group B of 175 CKD p without stroke [males-116p (66.3%), females- 59p (33.7%), mean age- 64.13±9.75 years] were assessed concerning classic and non-classic risk factors for stroke, prevalence of stroke- according to the type and stages of CKD, and predictors for developing stroke. Also a gender- and age- matched normal controls group (C) was assessed with regard to the same parameters. A subgroup of 31 p out of the 180 p with CKD + stroke, underwent extracranial and transcranial Doppler ultrasound in order to assess the resistance index (RI) in the internal carotid arteries (ICA_S) and the middle cerebral arteries (MCA_S). The RI was correlated with the risk factors proved as significant.
Results: The incidence of ischaemic stroke was 7.35% and of recurrent stroke recorded in CKD p (group A) was 3.24%. Risk factors for stroke were serum creatinine (OR.=2.20, P=0.0001), glomerular filtration rate (GFR) (OR.=0.98, P=0.001), proteinuria (OR.=1.74, P=0.031), C-reactive protein (CRP) (OR.=1.90, P=0.006), fibrinogen (F) (OR.=1.84, P=0.005), haemoglobin (OR.=1.68, P=0.041). The prevalence of stroke in relationship with the stages of CKD: stage 1- 1.1%, stage 2- 22.8% (OR.=1.11), stage 3- 32.8% (OR.=1.30), stage 4- 24.4% (OR.=2.27), stage 5- 18.9% (OR.=2.68) Predictors for incident and/or for recurrent ischaemic stroke: proteinuria (OR.1.71, P=0.036), CRP (OR.=1.68, P=0.001), F (OR.=1.43, P=0.043), GFR (OR.=1.79, P=0.016). The RI correlated significantly in the ICA_S with F (r=0.188, $P<0.0001$), CRP (r= 0.188, $P<0.0001$), haemoglobin (r= -0.45, $P<0.0001$); in the MCA_S fibrinogen (r= 0.1126, $P<0.0001$), CRP (r= 0.112, $P<0.0001$), haemoglobin (r= -0.65, $p<0.0001$), proteinuria (r= 0.21, $P<0.001$).
Conclusions: The incidence of ischaemic stroke is high in pre-dialysis CKD p. The prevalence of stroke is significant even in the early stages of CKD. Markers of inflammation, proteinuria, haemoglobin, and the level of renal function were the most significant risk factors for the occurrence/recurrence of stroke and for cerebral vessels remodelling.

FP169 MODERATE REDUCTION OF PRE OP GFR IS ASSOCIATED WITH POORER PROGNOSIS IN PATIENTS UNDERGOING GENERAL SURGERY

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Introduction and Aims: The aim of this study was to evaluate the effects of decreased GFR on post op prognosis of patients undergoing general surgery interventions.
Methods: We investigated 942 randomly assigned patients to this study (442 male, 500 female, average age 55.68±16.31 years) needing general surgery intervention. History for previous renal disease (renal function investigations) for hypertension (HT) and for diabetes mellitus (DM) was investigated. There have been followed up: blood pressure, hemoglobin, fasting blood glucose, urine output, serum creatinine, GFR (MDRD 4), criteria for sepsis and the survival of the patients. Data have been processed using the R Package statistical software. The t-test and the Fisher exact test were used for two-group comparisons and multiple regression analysis to evaluate influence of biological data on post op outcome.
Results: Patients have been divided into two groups: group 1- pre op GFR <60 ml/min/1,73m^2, 24.73% of the cases (average GFR = 44.43±13.06 ml/min/1.73m^2) and group 2 - pre op GFR >60 ml/min/1,73m^2, 75.27% of the cases (average GFR 93.71±33.74 ml/min/1.73m^2. In group 1 patients presented significantly higher average age (65.48±11.36 vs. 52.47±16.41 years – $p<0.001$) and higher prevalence of DM (52.36% vs. 30.18% - $p=0.0001$). Concerning the complications, the prevalence of sepsis and of ARF (according to RIFLE criteria) was significantly higher in the first group (9.87% vs. 2.96% - $p<0.0001$) and (30.04% vs. 3.94% - $p<0.0001$). 18.02% of the patients died in the post op period in group 1 as compared to 4.79% in group 2 ($p<0.0001$). The post op outcome was influenced by age of the patients the presence of ARF, of sepsis of high fasting blood sugar and low systolic blood pressure and not by the other clinical and biological data that have been followed up. There was an extremely strong dependency between ARF and low pre op GFR and we interpret these latter results as a direct consequence this fact.
Conclusions: Our analysis suggests that even moderate reduction of pre op GFR in patients undergoing general surgery is a risk factor for the development ARF and sepsis and a poor post op prognosis predictor.

FP170 INCIDENT END STAGE RENAL DISEASE (ESRD), MORTALITY AND PREDICTORS OF RENAL DEATH IN CKD PATIENTS REGULARLY FOLLOWED IN NEPHROLOGY: FOLLOW UP OF THE TARGET BLOOD PRESSURE LEVELS (TABLE) COHORT

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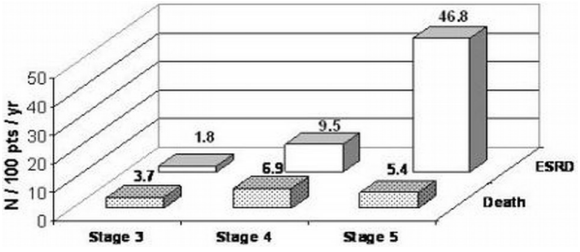
Introduction and Aims: In US and North Europe cohorts of CKD patients

selected from general population, incidence of death is 2 to 50 times greater than that of ESRD and associated with CKD severity. Whether the same holds true in tertiary nephrology care is unknown. We evaluated outcome and determinants of renal death in the Italian TABLE cohort of CKD patients.

Methods: Large prospective cohort was constituted enrolling all consecutive patients attending 26 renal clinics during a 6-month period of 2002/03 that had diagnosis of CKD, GFR<60 ml/min/1.73m^2 (no dialysis-no transplant) and Nephrology care from ≥6 months. Follow up for renal death (all-cause death, ESRD) ended at 11/30/06. Survival analysis was performed by means of incidence rates and Cox regression model.

Results: Out of 1353 patients screened, 1269 met selection criteria (stage 3, 4, 5: 596, 504, 169). At baseline age was 66±14 y, males 57%, diabetics 28%, cardiovascular (CV) disease 31%, GFR 30.4±13.8 mL/min/1.73 m^2, systolic blood pressure (SBP) 139±18 mmHg, total cholesterol (TC) 199±42 mg/dL, haemoglobin (Hb) 12.5±1.8 g/dL, proteinuria 1.03±1.43 g/day. CEI or ARB were prescribed in 72% of patients, statin in 21% and epoietin in 13%. During a median follow up of 30 months, 258 patients reached ESRD while 150 died (72% for CV cause) with incidence rates of 8.8 versus 5.1/100 pts/yr (Figure). Cox model (hazard ratio and 95% confidence interval) showed that age (1.02, 1.01-1.02, P=0.001), diabetes (1.26, 1.00-1.60, P=0.049), CV disease (1.57, 1.24-1.97, P=0.0001), and proteinuria (1.14, 1.08-1.21, P<0.0001) predicted renal death, while a protective role was found for GFR (0.93, 0.92-0.94, P<0.0001), Hb (0.92, 0.85-0.98, P=0.015) and statin prescription (0.64, 0.47-0.87, P=0.004). Gender, SBP, TC, and use of CEI/ARB were not significant.



Conclusions: In CKD patients followed in Italian renal clinics, mortality is less frequent than ESRD and does not increase with worsening of CKD. Discrepancy with previous studies may be due to the tertiary care setting and the lower background Italian population CV mortality. Under these conditions, renal survival can be improved by larger use of statins and more intensive treatment of proteinuria and anemia.

FP171 ASSOCIATION OF METABOLIC SYNDROME AND CHRONIC KIDNEY DISEASE (CKD) IN KOREA: RESULTS FROM KOREAN NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (KOREAN NHANES)

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Introduction and Aims: CKD is now a worldwide epidemic, which is possibly due to the continuous increase in the prevalence of MS. MS has been shown to be strongly associated with CKD in several cohort studies from different countries. Incidence of end stage renal disease (ESRD) in Korea is increasing more than 10% annually, which takes the 11th rank in the world according to USRDS in 2006. Early detection and treatment of the risk factors for CKD have a paramount importance to reduce the incidence of ESRD. To better understand the clinical implication of MS as a risk factor of CKD and its characteristics which is possibly different in each countries with different ethnic background and life style, we performed a cross-sectional study in non-institutionalized Korean civilian using the data of Korean NHANES in 2001.

Methods: Of 7,918 participants, 5,491 at age between 20 and 79 years were available for analysis for the prevalence of CKD (defined as dipstick proteinuria or a reduced GFR less than 60 ml/min per 1.73m^2 by MDRD formula). MS was diagnosed by original NCEP-ATP III criteria (waist circumference, 102 cm for men and 88 cm for women, NCEP-O) or NCEP-ATP III with the Asia-Pacific abdominal obesity criteria (90 cm for men, 80 cm for women, NCEP-AP).

Results: Overall, 33.9%, 16.2%, 33.1%, 49.0%, 9.9% and 33.6% of the participants had elevated blood pressure, high plasma glucose, high triglyceride, low HDL-cholesterol and abdominal obesity by NCEP-O and NCEP-AP, respectively. The prevalence of MS was 18.0% by NCEP-O and 25.7% by NECP-AP. CKD was seen in 8.7% of subjects. In subjects with MS, the prevalence of CKD was higher (18.3 vs. 6.7%, p=0.0001) with a lower GFR (74.2 vs. 80.1 ml/min/1.73 m^2, p<0.0001) compared to subjects without MS. There was a significant graded increase in the prevalence of CKD with number of components of MS. The multivariate-adjusted odds ratio of CKD in subjects with MS compared with subjects without MS was 1.50 (95% CI, 1.19 to 1.90, p<0.0001). Compared with subjects with 0 or 1 components, subjects with 5 components of MS had multivariate-adjusted odds ratio of 6.58 (CI, 4.07 to 7.74, p=0.001).

Conclusions: Metabolic syndrome is a significant determinant of CKD in Korean general population. Prevalence of low HDL-cholesterol was higher compared to studies from the US and Japan with a variable prevalence of CKD.

FP172 CLINICOPATHOLOGIC STUDY FOR ASYMPTOMATIC URINARY ABNORMALITIES

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Introduction and Aims: Since 1998, by law, all school children in Korea must have an annual urinalysis. The first early morning urine specimen is examined by a simple dipstick method for the detection of proteinuria, hematuria and sugar. If a urine test is positive, a second test is performed by pediatric nephrologists. We analyzed the results of clinical data and the renal biopsy findings of patients detected by school urinalysis screening from 1998 to 2005.

Methods: We analyzed urinalysis data of 2,100 children referred for urinary abnormalities by school urinalysis screening. We also investigated histopathologic findings and diagnosis of 1,300 asymptomatic persistent and/or proteinuria patients who took renal biopsy.

Results: The male to female ratio was 1.4:1 and the mean age 9.8 years. The chief complaints for renal biopsy were 578 cases (45.3%) of isolated hematuria, 109 cases (8.5%) of isolated proteinuria and 479 cases (37.5%) of hematuria combined with proteinuria. In the histopathological findings, primary glomerular disease was 75.8% which was IgA nephropathy in 30.1%, mesangial proliferative glomerulonephritis in 27.2%. Systemic disease was 11.4% which was Henoch-Schonlein nephritis in 10.4%, and lupus nephritis in 0.8%. Alport syndrome showed 1.2% as a hereditary disease.

Conclusions: Early detection through school urinalysis screening and confirm diagnosis by renal biopsy seem to be helpful for assessment of prognosis and intervention of disease progression.

FP174 GETTING THE MOST FROM NEPHROLOGY OUTPATIENTS: ΔeGFR AN INTUITIVE METHOD OF ASSESSING PROGRESSION AND REGRESSION OF CHRONIC KIDNEY DISEASE (CKD)

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Introduction and Aims: The number of patients receiving renal replacement therapy in the UK is rising rapidly, costing over 2% of the total NHS budget[1]. The Renal Association have published referral guidelines[2] for CKD re-emphasising the importance of assessing patients with progressive CKD at Nephrology outpatients.

In the light of current guidelines our aim was to investigate if the assessment and referral of patients is appropriate based on the progressive risk of CKD.

Methods: In Northern Ireland 2,892,340 creatinine samples from 1st Jan 2001 - 31st Dec 2002 were extracted from regional laboratories. Merging

these to an enriched General Practice dataset produced a cohort of 75,434 subjects containing 307,663 results. To capture progression over the two-year period, a three-point assessment was devised. Progression and periods of regression were characterised by the gradients ΔA and ΔB. A cut-off level (eGFR 60mls/min) was additionally used to categorise the change in patient's eGFR. Progression was also categorised as stable (<1mls/min/yr), slow (1-5mls/min/yr) and rapid (>5mls/min/yr).

Results: 56,356 (74.7%) subjects had "all eGFR results" >60 mls/min throughout the entire period, 11,249 (14.9%) had "all eGFR results" <60 mls/min and 5017 (6.7%) had a minimum eGFR measured below 60mls/min and yet subsequently had a value measured above 60mls/min. In total, 1,167 were known to Nephrology services. Of these, 341 (29.2%) had an eGFR>60mls/min over the two year period. Importantly 2,699 (3.6%) subjects unknown to nephrology demonstrated a rapid decline from stages 1 or 2 CKD to stage 3 or worse.

Conclusions: Progression of CKD is often taught to be linear; this data indicates that alternative patterns of progression occur in the natural history of CKD, including improvement in function. Significant numbers of subjects attending Nephrology services have no evidence of progressive decline in eGFR whilst the vast majority with CKD remain unseen. Although some of these patients may have important reasons for attending Nephrology services, this may be to the detriment of those with more progressive CKD.

References: 1. Roderick, P., Davies, R., Jones, C., Feest, T., Smith, S., Farrington, K., *Simulation Model of Renal Replacement Therapy: Predicting Future Demand in England*, Nephrol Dial Transplant, 2004; 19(3): 692-701. 2. The Renal Association, UK CKD eGuide, http://www.renal.org.html.

FP175 PREVALENCE OF RENAL DISEASE IN HEPATITIS C INFECTED PATIENTS

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Introduction and Aims: The reported incidence and sequelae of Hepatitis C varies significantly internationally and extra-hepatic manifestations of the disease are common. However, despite the well recognised association between hepatitis C and glomerulonephritis, the prevalence of renal disease in this population has not been studied. The purpose of this prospective study was to determine the prevalence of and risk factors for renal disease in a Northern European population attending a specialist Hepatitis C clinic.

Methods: All patients attending the specialist hepatitis C clinic during a 3 month period provided urine and blood samples for renal and liver function, cryoglobulins, complement, anti-nuclear factor, rheumatoid factor and immunoglobulins. Renal disease was defined by the presence of significant proteinuria (>300mg/24hrs), abnormal urinalysis (x3) and/or a raised serum creatinine (>110mmol/l).

Results: 72 patients (41 male) were included in the study. 59 were HCV PCR positive and 13 were currently PCR negative. 46 patients had a history of intravenous drug use, 18 had received infected anti-D immunoglobulin and 8 were sporadic cases. Mean age was 40.9±10.9 years. 65% of patients were genotype 1 and 35% were genotype 3. Mean duration of infection was 13.1±9.5 years. 33% were ANF positive and 47% were RF positive. None of the patients had a history of diabetes mellitus or hypertension.

8 patients (11%) had evidence of renal disease. 7 patients had proteinuria and 1 had an abnormal urinalysis. All 8 patients were PCR positive. There was no difference in age, gender, duration of infection or aetiology between those with and without renal disease. There was a trend towards increased inflammation and fibrosis in the liver biopsies of those with renal disease. Patients with renal disease were more likely to have cryoglobulinaemia (63% v 22%, p=0.01). Serum creatinine was within the normal range in all but one patient.

Cryoglobulins were present in 27%. None of the PCR negative participants had cryoglobulinaemia. There was also no difference in age, gender, duration of infection or aetiology between those with and without cryoglobulins. Cryoglobulinaemic patients were significantly more likely to be rheumatoid factor positive (76 v 35%, p=0.008), had higher ALT levels (93 v 50, p=0.02), lower C4 (0.21 v 0.24, p=0.05) and higher IgG levels (16.5 v 13.7, (p=0.003).

Conclusions: As far as we are aware, this is the first prospective study to examine the incidence of renal disease in a population of patients with hepatitis C. Overall, 11% of the patients in this study had evidence of renal disease and 27% had cryoglobulinaemia. This represents a higher prevalence of renal disease in those with hepatitis C than in the general population. We suggest that all patients with hepatitis C, particularly those with cryoglobulinaemia, should be screened for renal disease as early recognition may allow appropriate treatment and possibly reduce future complications. Further studies are required to confirm these findings.

FP176 ★ GENDER DIFFERENCE IN CKD-MBD AMONG PRE-DIALYSIS PATIENTS (OVIDS-CKD)

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Introduction and Aims: We have reported the importance of gender difference in CKD-MBD among hemodialysis patients. CKD-MBD is characterized by three abnormalities; laboratory abnormalities, bone abnormalities, and calcification of vasculature. Male gender is associated with the severer calcification both in hemodialysis and pre-dialysis patients. But little is known about the gender difference in pre-dialysis CKD patients. Our aim is to elucidate the effect of gender on laboratory and bone abnormalities.

Methods: We conducted a cross-sectional observational study in CKD patients (OVIDS-CKD; Osaka Vitamin D Study in CKD), who had not received or were not receiving glucocorticoid, bisphosphonates, or active vitamin D. Pre-menopausal females were excluded. Whole PTH (wPTH), bone specific alkaline phosphatase (BSAP), adjusted calcium (Ca), phosphorus (P), 25-hydroxyvitamin D (25-OHD), and estradiol (E2) were measured. We studied the interaction of gender with the relationship between laboratory parameters and estimated glomerular filtration rate (eGFR). We also measured bone mineral density (BMD) in lumbar spine and femoral neck by dual X-ray absorptiometry. Multiple linear regression analysis for BMD T-score was performed to determine the significant contributors.

Results: We enrolled 249 patients (186 males, mean age 60.7 years, eGFR 45.8 23.2 mL/min/1.73m^2). P was significantly higher in female, but no difference was observed in Ca between genders. E2, which elevated with the reduction of eGFR in both sexes, was significantly higher in male throughout CKD stages. Whole PTH increased as renal function declined without significant difference between genders. However, BSAP was statistically higher in female. Thus, BSAP/wPTH, which denotes skeletal sensitivity to PTH, was significantly higher in female at eGFR ≥30. But at the lower eGFR, there was no difference between genders (Fig. 1). Multiple linear regression analyses revealed that the significant positive contributors to higher lumbar T-score were E2, BMI, and 25-OHD, whereas in femoral neck 25-OHD, E2, BMI, and eGFR were the positive contributors. BSAP was negatively associated with both lumbar and femoral neck T-scores.

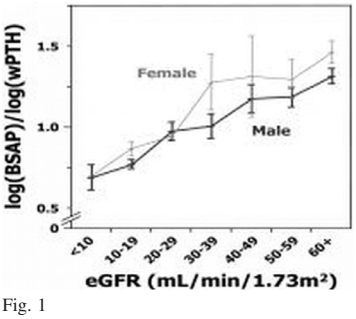

Fig. 1

Conclusions: Females seemed to have higher sensitivity of the bone to PTH than males at eGFR ≥30, although the effect of uremia might override the gender effect at eGFR <30. The higher E2 levels in males and the positive correlations between E2 and BMD implied protective effect of E2 on bone metabolism. We should pay attention to gender difference in the management of CKD-MBD in pre-dialysis patients.

FP177 ★ CLINICAL CHARACTERISTICS OF THE POPULATION FROM THE CROATIAN FOCUS OF ENDEMIC NEPHROPATHY

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Introduction and Aims: The aim of this study was to establish clinical and laboratory characteristics of the population living in the Croatian region of endemic nephropathy (EN).
Methods: This study included 738 individuals from EN villages (307 male (M), 431 female (F)), and 120 subjects from a control village (K) (50 M, 70 F). No differences in the distribution of gender and age were observed between EN and K ($p<0.01$). Following administration of a detailed questionnaire and clinical examination, investigators obtained blood and urine samples from the subjects. The population was classified according to WHO criteria as diseased (D), suspect (S), at risk (R) and others (O). The following definitions were used: microalbuminuria (MA) > 30 mg/l; alpha-1-microalbuminuria (alpha-1) >20 mg/l, hypertension, BP > 140/90 mmHg and/or antihypertensive drug therapy; and anemia (AN) as Hb < 120 g/l in M and <113 g/l in F. Renal disease (RD) was classified according to NKF classification.
Results: The frequency of the WHO categories in this group was: D=1.4% (M, 1.73% vs. F, 1.34%, respectively), S=5.6% (M, 7.79% vs. F, 4.83%). If we analyze only the portion of population who resided >20 years in an EN village, then the incidence of D is 1.8% and of S is 6.8%. In the subgroup of persons living in EN villages < 10 years, there was none in the D group and only 2% were in the S category. In the EN villages, we found an increased MA frequency compared with K (20.0% vs. 9.8% M, respectively; 16.6% vs. 9.37% F, respectively), as well as an increased frequency of alpha-1 (21.73% vs. 13.72% M, respectively; F 9.48% vs. 4.54%, respectively). No similar differences were observed between subgroup O and K. The prevalence of hypertension was slightly lower in EN villages than in K (51.75% vs. 58.9%; M 54.07% vs. 57.1%; F 51.97% vs. 58.46%, respectively). There were no differences in the frequency of RD stages > 2 (by NKF classifications) or in anemia between EN and K. The duration of residence in EN villages was significantly correlated to MA, alpha-1 and serum creatinine, but was not significant for those living < 20 years in EN area and in residents. A significant correlation was observed between years living in an EN area and the presence of MA, alpha-1 and serum creatinine even in persons in WHO categories R and O.
Conclusions: The incidence of D and S in this group has remained the same as before. The duration of residence in the endemic area affects EN prevalence. The two village populations differed in MA, alpha-1, and hypertension frequency but not in anemia and renal disease stage >2. The known significant association between early renal impairment in persons classified as R and O living in EN villages, indicates that new diagnoses of S and D will be registered in the next several years regardless of whether the causative agent is still present or active.

FP178 ★ PREDICTORS OF GLOMERULAR FILTRATION RATE IN CONGESTIVE HEART FAILURE – THE NORWEGIAN EXPERIENCE

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Introduction and Aims: Renal dysfunction is common in patients with congestive heart failure (CHF) and is associated with an adverse prognosis. The aim of this study was to determine predictors of glomerular filtration rate (GFR) in a Norwegian cohort with congestive heart failure.
Methods: The registry contains data from 26 heart failure out-patient clinics at regional hospitals. Patients with heart failure NYHA class I-IV were consecutively included at the first contact. For this analysis only patients with systolic dysfunction with ejection fraction (EF) < 45% were included, and baseline data from 2665 patients (age 69.3±11.9 years, 25.6% females) with CHF (NYHA class I: 4.5%, II: 41.9%, IIIA: 39.8%, IIIB: 12.3%, IV: 1.6%) were used. GFR was determined with the sMDRD formula, and classified accordingly in stages 1-5 of chronic kidney disease (CKD). In multiple regression analysis with GFR as the dependent variable, age, sex, ejection fraction (EF), NYHA class, systolic blood pressure (SBP), use of ACE inhibitor/ARB and body mass index (BMI) were entered as independent variables.
Results: Mean EF was 29±8% in this cohort. Average GFR was 65.4±23.1 ml/min. The prevalence of GFR < 60 ml/min was 44.7%, 13.7% had CKD stage 1, 43.1% stage 2, 37.8% stage 3, 4.7% stage 4, 0.6% had CKD stage 5. The use of ACE inhibitors (79%) or angiotensin II receptor antagonist ARB (27%) was prevalent, and close to 20% used combination of the two drugs. 14% used neither ACE inhibitor or ARB. Multiple regression analysis revealed that all entered variables except EF (p=0.157) were independently and significantly related to GFR, age ($p<0.001$), gender ($p<0.001$), SBP ($p<0.001$), NYHA class ($p<0.001$), BMI ($p<0.001$), use of ACE inhibitor/ARB (p=0.024). Among subjects below 60 years only age came out as an independent predictor ($p<0.001$), while gender did not reach statistical significance (p=0.09). While in subjects > 60 years of age (n=1792), age and gender remained independent predictors as did BMI, NYHA class and SBP while EF and use of ACE inhibitors and/or ARB did not reach statistical significance as independent predictors (p=0.053 and 0.082 respectively).
Conclusions: In this population with systolic dysfunction and CHF and with EF < 45%, renal dysfunction was prevalent with 44% had GFR below 60 ml/min. A total of 86% used ACE inhibitors and/or ARB, and this was associated with higher GFR. Age and gender were the strongest independent predictors of GFR. In this cohort, EF was not a independent predictor in contrast to NYHA class, SBP and BMI.

FP179 CHRONIC KIDNEY DISEASE IN PRIMARY CARE SETTINGS IN SPAIN. THE EROCAP STUDY

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Introduction and Aims: This cross-sectional, multicenter study investigated the prevalence of chronic kidney disease (CKD) and associated disorders, in an adult population sample (>18 years old) attending Primary Care services in Spain.
Methods: Estimated glomerular filtration rate (Modification of Diet in Renal Disease equation) was used for analysis of CKD prevalence according to NFK-KDOQI stages.
Results: Serum creatinine and other laboratory parameters, blood pressure and medical history of cardiovascular risk factors or disease (hypertension, dislypidemia, diabetes, congestive heart failure, coronary artery disesase, stroke or peripheral vascular disease) were obtained in 7202 patients attending Primary Care Centers. 47.3% were males, mean age 60,6±14,3 years, BMI 28.2±5.3 kg/m^2, 27,6% were overweight (27-30 kg/m^2) and 32,1% obese (BMI ≥30kg/m^2), The prevalence of cardiovascular (CV) risks factors (RF) were: absence in 17,3%, one factor 26,9% two 31,2%, and 23,6% presented ≥3. The frequency of CVRF was: hypertension (66,7%), dyslipidemia (48%) and diabetes (31,5%). Congestive heart failure, coronary artery disease, stroke or peripheral vascular disease prevalence was lower than 10%.
The prevalence of eGFR <60 ml/min/1.73 m^2 was: stage 3 (GFR 60-30 ml/min) 19,7%; stage 4 (GFR 30-15 ml/min) 1,2%; stage 5 no dialysis (GFR <15 ml/min) 0,4%. This prevalence increased with age in both sexes and 33,7% of patients attending Primary Care services over 70 years presented an eGFR < 60 ml/min. Of the total number of patients having an eGFR< 60 ml/min 37.3% had serum creatinine levels within the normal range.
Conclusions: This study documents the substantial prevalence of significantly abnormal renal function among patients attended at the Primary

Care level. Early identification and appropriate nephrological management of these patients with renal disease is an important opportunity for an adequate prescription of drugs that interfere with renal function, to delay the progression of renal disease and modify CVRF.

FP180 CAN A PHYSIOTHERAPY-LED OUTPATIENT RENAL REHABILITATION PROGRAMME ACHIEVE SIGNIFICANT IMPROVEMENTS IN EXERCISE CAPACITY, FUNCTIONAL ABILITY AND QUALITY OF LIFE IN PATIENTS WITH CHRONIC KIDNEY DISEASE (CKD)

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Introduction and Aims: The majority of patients can exercise during all stages of chronic kidney disease (CKD) but exercise is still not routinely advocated in renal disease compared with best practice in other diseased populations such as cardiac and pulmonary disease. The first U.K physiotherapy-led Renal Rehabilitation Programme, comprising of 12 weeks of twice-weekly supervised exercise and education sessions, and once-weekly specific home exercises, was initiated to determine whether patients with CKD could achieve significant improvements in exercise capacity and functional ability.
Methods: 30 patients (13M;17F) have completed 12 weeks in the programme and have been monitored for exercise performance tests at baseline and 12 weeks. Exercise performance tests included the Incremental Shuttle Walk Test (ISWT), sit to stand 60 (STS60), timed up and go 3m (TUAG3m), stair climb/descent (SCD), Duke's activity status index (DASI) and the Hospital Anxiety Depression assessment (HAD).
Results: Student's paired *t*-test analyses were performed to assess differences between baseline and 12 week data. ISWT improved by 54% ($p<0.001$), STS60 by 40% ($p<0.001$), TUAG3m by 28% ($p<0.001$), SCD by 33% ($p<0.001$), DASI by 67% ($p<0.001$), HAD anxiety score by 11% ($p<0.001$) and HAD depression score by 27% ($p<0.001$) after 12 weeks.
Conclusions: Increased fitness and muscle strength makes activities of daily living easier as is demonstrated by the significant improvements in the DASI score, and enables some people to increase return to activities that they enjoy such as walking or playing sport. Preliminary experience from this renal rehabilitation programme combining 12 weeks of exercise and education suggests that significant improvements in exercise capacity and physical functioning can be achieved in CKD patients with a supervised outpatient exercise programme.

FP181 SHORT TERM SURVIVAL IN CHRONIC KIDNEY DISEASE PATIENTS WITH STROKE

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Introduction and Aims: Chronic kidney disease (CKD) occurs commonly in patients with vascular disease. In addition, CKD is a risk factor for the development and progression of vascular disease. Recent studies have confirmed that even early CKD constitutes a significant risk factor for non-fatal cardiovascular events and death. Our aim was first to investigate in a large series of consecutive patients hospitalized for stroke the prevalence of CKD and second to assess determinants short-term survival, in this high risk population with associated cardiovascular disease and CKD.
Methods: Study population: 1090 consecutive subjects (mean age was 66.6±11.5 years, 49.3% males) admitted for confirmed (by CT scan) ischemic or hemorrhagic stroke. Collected data: associated comorbidities, cause of CKD, biochemical parameters at admission including serum creatinine, development of acute renal failure during hospitalization (as defined by RIFLE criteria) and 30 days survival.
Results: The demographic characteristics of the study group are presented in Table 1. There were no significant differences in biochemical parameters between the four CKD subgroups, at baseline. In this cohort, 187 patients died during the first 30 days after stroke.

The deceased patients were older, had higher serum creatinine at admission and higher serum glucose ($p<0.05$). The mean survival in CKD stage 4 and 5 patients was 16±2 days, significantly worse than for other CKD stages (log rank test = 0.0001). Cox Regression model show age (RR = 1,037, 95% CI = 1.021-1.054), serum glucose (RR = 1.005, 95% CI = 1.002-1.007), CKD stage4 and 5 (RR = 2.563, 95% CI = 1.489-4.409), presence of chronic heart failure (RR = 0.418, 95% CI = 0.3-0.583), type of stroke (RR = 2.59, 95% CI = 1,87-3.67) and development of acute renal failure (RR = 0.326, 95% CI = 0.22-0.483) to be predictors of 30 day survival.

Table 1. Demographic characteristics of the study group

N = 1090	CKD 1 N = 167	CKD 2 N = 551	CKD 3 N = 328	CKD 4-5 N = 44
Age (year)	59.9±12.4	64.9±11.3	70.2±9.4	71.5±10.6*
Males (%)	74.2%	52.8%	32.9%	31.8%*
Diabetes mellitus (%)	21%	24.5%	35.1%	31.1%*
Acute renal failure (%)	1.1%	4.5%	31.1%	65.9%*
Deaths (%)	15.5%	11.9%	21.9%	52.2%*
Mean survival (day)	26±1	27±1	25±1	16±2**

*$p < 0.05$ for trend, **$p< 0.05$ at Kaplan Meier analysis for CKD stage 4-5 vs other CKD stages

Conclusions: A chronically impaired renal function is frequently encountered in patients admitted with stroke and has severe impact on short-term mortality and morbidity.

FP182 CHRONIC KIDNEY DISEASE MINERAL AND BONE DISORDER (MBD) MANAGEMENT IN CKD STAGE 3-4. MERENA STUDY

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Introduction and Aims: K/DOQI® Guidelines defines the treatment and the targets for CKD mineral and bone mineral disorder (BMD) management at every CKD stage. A lot of information concerning BMD on dialysis patients is now available but very little is known about CKD stages 3 and 4.
AIM: To describe the Guidelines adherence and clinical management of BMD in Nephrology Outpatient Clinic (NOC) all over the country.
Methods: MERENA is an observational prospective, multicentre study to describe the global clinical management and three years outcome of CKD patients in stage 3-4. Nephrologist collected data in a web-based electronic CRF. We analyse here the basal data of the cohort related to BMD-CKD treatment and the targets obtained.
Results: (marked as *:$p<0.0001$;+:$p<0,01$). 1115 patients from 50 NOCs were included (CCr:31±10 ml/min, aged: 67±13 y.). We classify patients in CKD3 and CKD4 using C-G formula and found 49% CKD 3 and 51% CKD 4 (CCr 23,1±4,2 vs 40,1±7,9 ml/min*). CKD 4 patients presented with higher serum phosphorus (P) (4,0±0,8 vs3,5±0,6 mg/dl*), CaxP product (37,2±7,7 vs33,4±6,1 mg^2/dl^2*) and intact-PTH (173,6±134 vs 125,4±95,6 pg/ml*) than CKD 3 ones. In spite of a higher use of phosphate binders (29,3 vs 11,3%*) and vitamin D (19,8 vs 10,3%*), CKD 4 patients shown lower target achievement: I-PTH >300 pg/ml (12,9 vs 4,2%*), hyperP (15,4 vs 4,2%*) and CaxP product >55 (2,8 vs 0,4%+). Only 17,2% of CKD 4 patients and 23% of CKD 3 achieve all the K/DOQI- BMD targets. The relative risk of iPTH>300 pg/ml was 3,29 IC [1,76-6,15] in CKD 4 vs CKD 3 adjusted by age and treatment. We found no differences between DM and Non-DM patients.
A majority (68%) of CKD-4 patients with I-PTH >150 pg/ml did not receive vitamin D (without a contraindication due to Ca or P levels) and 53% of patients that should be under chelant treatment did not receive it. 70% of patients with an I-PTH of 131 pg/ml (31,4% > 150 pg/ml) and a serum P up to 6,7, didn't receive phosphate binders nor vit D in spite of 43 months under nephrologist care, but 93% of them received antihypertensive agents and 20% erythropoietic agents.
Conclusions: We present now large-scale data concerning BMD management on CKD 3 and 4. Nephrologists seem to undertreat BMD with poor Guidelines adherence and results.

FP183 THE EVALUATION OF EFFECTS OF L-CARNITINE SUPPLEMENTATION ON PREVENTION OF MUSCULAR SYMPTOMS IN PATIENTS UNDER CHRONIC HEMODIALYSIS

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Introduction and Aims: L-carnitine plays an important role in oxidation of fatty acids. It is essential in tissues that preferentially use fatty acids for their energy needs, especially skeletal muscle and myocardium. It is lost from plasma during hemodialysis and is lower in skeletal muscle of end-stage renal disease (ESRD) patients undergoing chronic hemodialysis. The aim of study was to evaluate effects of L-carnitine supplementation on prevention of muscular symptoms in patients under chronic hemodialysis.
Methods: In a double-blind clinical trial, sixty ESRD patients were assigned to two groups: Group A consisted of 30 patients who received 500 mg oral L-carnitine everyday for 8 weeks, and group B received a placebo. At 2, 4, and 8 weeks after the initiation of treatment, subjects were asked about muscle symptoms (weakness, fatigue, cramps/aches).
Results: 93.2% of subjects of group A had at least some improvement in muscular symptoms. Five patients (16.6%) reported mild progress, 11 (36.6%) had moderate and 12 (40%) reported marked improvement. Whereas, only nine subjects (30%) reported some mild improved muscular symptoms and the rest (70%) did not report any improvement. ($p<0.05$).
Conclusions: Low-dose L-carnitine supplementation in hemodialysis patients improves muscular symptoms and their sense of wellbeing by restoring carnitine tissue levels and washing out cumulative acyl moieties.

FP184 BONE MARROW IRON STORES AND IV IRON SUPPLEMENTATION IN ANEMIA OF NON-DIALYZED CKD PATIENTS

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Introduction and Aims: Iron deficiency is common in anemic CKD non-dialyzed patients. By it's correction only, about 1/3 of patients reached the hemoglobin (Hb) target. Peripheral markers of iron deficiency are not validated yet and central markers (eg bone marrow iron stores) are seldom reported.
This study aims to evaluate the relation among the bone marrow iron stores, peripheral markers of iron deficiency and therapeutic effect of IV iron sucrose in anemic CKD non-dialyzed patients.
Methods: 70 anemic ($Hb \leq 10.5$g/dL) CKD patients EPO and iron-naive were enrolled [55% men; median age 60 (24-84yrs)]. The main primary renal diseases were vascular and glomerular nephropathies (43% and 33%); only 11% had diabetic nephropathy. The mean eGFR (MDRD) was 15.7±9.6mL/min (64% CKD stage 5). 40% had CRP<10mg/L.
Hb, central [bone marrow aspiration, Prussian Blue stain, type I and II syderoblasts (%)] and peripheral [serum iron, serum transferrin saturation (TS), serum ferritin] parameters of iron status were evaluated at baseline. The percentual distributions of patients according to bone marrow iron stores (absent, normal, high) in quartiles of serum iron, TS and serum ferritin were evaluated. One month after therapy (iron sucrose - VENOFER® - 200mg IV push in 2-5min, daily for 5 days), Hb and peripheral parameters of iron status were reassessed.
Results: At baseline, iron stores were absent in 46%, normal in 38% and increased in 16% of patients. A ferritin level<185ng/mL was more frequently associated with depleted iron stores(63% of patients vs 28%), as were iron serum < 62μg/dL(66% vs 26%) and TS< 25%(63.2% vs 25%)
Mean Hb significantly increased after iron therapy irrespective of iron stores, but the patients with low and normal iron stores had significantly faster rates (1.13±0.3 and 1.04±0.19g/dL/month) than those with high ones(0.8±0.4g/dL/month). 36% more patients attained the local target Hb>10.5g/dL(47% vs 11%; $p<0.05$); the increase was significant only in those with low and normal iron stores(46% and 58%) than in those with high iron stores(1%).
Neither renal function nor inflammation did influence the relation among central and peripheral markers of iron deficiency or the treatment outcome.

	Bone marrow iron stores		
	A - Absent	B - Normal	C - Increased
Patients(%)	32(46%)	27(38%)	11(16%)
Baseline			
Hb (g/dL, mean±SD)	8.99±1.24 (1)	9.48±0.9 (2)	8.55±0.9
Serum iron (mcg/L)*μ	50 [17-93] (1)	75 [45-156] (2)	78 [37-120] (3)
TS (%, mean±SD)	21.6±7.5 (1)	26.7±8 (2)	31±8.7 (3)
Serum ferritin (mcg/L)*	125 [39-510] (1)	209 [56-450] (2)	357 [113-727] (3)
After iron therapy			
Hb (g/dL, mean±SD)	10.09±1.2	10.43±0.9	9.34±0.9
ΔHb (g/dL, mean±SD)	1.13±0.3	1.04±0.19 (2)	0.80±0.4 (3)

*median, iq range; (1) $p<0.05$; A vs B; (2) $p<0.05$; B vs C; (3) $p<0.05$; A vs C

Conclusions: Although iron stores, ferritin level and TS seem to be useful indicators of absolute iron deficiency, predicting the increase in Hb after correction, the therapeutic trial of iron supplementation is worthy in anemic pre-dialysis CKD patients as even those with repleted iron stores could respond to IV iron.

FP185 A PROSPECTIVE COHORT STUDY OF SURVIVAL IN INCIDENT ADULTS WITH END STAGE KIDNEY DISEASE, RESIDENT IN SOUTH WEST IRELAND

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Introduction and Aims: In the Republic of Ireland there is currently no registry of end stage kidney disease (ESKD). This study prospectively follows the cohort resident in counties Cork and Kerry (population 580,356) commencing renal replacement therapy (RRT) from 01.01.2002 to 31.12.2005. Survival and the factors that predict survival were modelled. UK Renal Registry data were used for comparison.
Methods: 197 adult subjects commenced RRT. Covariates include: age at start RRT ESKD aetiology, mode of RRT, initial type of dialysis access and nephrology review for at least 3 months prior to RRT. Co-morbidity was measured by Davies index. Serum albumin at commencement of RRT was recorded. Survival time was from commencement of RRT to 1.05.2006 or death, without censure at transplant. Cox regression was used to model potential factors influencing survival and to derive crude and adjusted hazard ratios (HR). Bidirectional stepwise model regression excluded covariates no longer associated with survival. Crude mortality rate was calculated. 1 year cohort survival was compared to the UK Renal Registry Report 2004.
Results: The crude mortality rate was 16.2 deaths per 100 person-years (95% CI 12.5, 21.0). 57 subjects died. Median follow up was 1.6 years (IQR 0.7, 2.8). Haemodialysis was the first modality in 162 (83%) subjects, and 34 (17%) commenced RRT with CAPD, with 1 pre-emptive transplant. Age, ESKD aetiology, mode of RRT and albumin<30g/L had crude effects, but were no longer associated with survival in the multivariate model.

Univariate & multivariate HR for death

n=196	Unadjusted HR (95% CI)	p wald test	Adjusted HR (95% CI)	p wald test
Davies Index 0	1.0		1.0	
1-2	12.2 (4.3,34.6)	<0.001	6.7 (3.2,26.2)	0.001
3-5	25.8 (8.7,76.3)	<0.001	9.1 (2.9, 28.5)	<0.001
Nephrology Review	0.28 (0.17,0.48)	<0.001	0.47 (0.25,0. 9)	0.02
Elective Access	1.0		1.0	
Tunnelled Catheter	5.1 (2.3,11.4)	<0.001	2.53 (1.1,5.9)	0.03
Temporary Catheter	10.4 (4.1, 26.5)	<0.001	3.49 (1.2, 10.1)	0.02
Transplant list	0.04 (0.01, 0.18)	<0.001	0.19 (0.3,0.9)	0.04

Unadjusted 1 year survival by age

		Age	KM survival (%)	KM 95%CI
SW Ireland	n=129	18-64	87.2%	80.0-92.0
	n=68	>65	66.9%	53.3-77.5
	n=197	All ages	81%	74.0-86.0
UK Registry	n=1,663	18-64	88.9%	87.4-90.4
	n=1,806	>65	67.0%	64.9-69.2
	n=3,469	All ages	77.6%	76.3-79.0

Co-morbidity, nephrology review, initial access and selection for transplant waiting list continue to be associated with survival on multivariate analysis.
Conclusions: In South-West Ireland, factors relating to elective commencement of dialysis (prior nephrology review, permanent initial dialysis access) result in a survival advantage. Subjects selected for transplant waiting list, despite adjustment for age and comorbidity have the strongest survival advantage. 1 year survival is similar to that of the UK Renal Registry.

FP186 ATHEROSCLEROTIC RENOVASCULAR DISEASE (ARVD) IN A HIGH CARDIOVASCULAR (CV) RISK POPULATION

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Introduction and Aims: ARVD may play a role in the pathophysiology and progression of cardiac heart failure and chronic renal failure. Few studies have addressed renal artery stenosis (RAS) prevalence in populations with high-very high CV risk, such us patients (pts) undergoing diagnostic or therapeutic cardiac catheterization.
This study was performed to determine the prevalence of ARVD in a cohort of patients with high CV risk, referred for diagnostic or therapeutic cardiac catheterization.
Methods: From April 2006, all consecutive pts undergoing cardiac catheterization (acute MI excluded) at a single institution were also evaluated for the presence of RAS by renal angiography. Clinical, laboratory and angiographic data were recorded. Pts enrolment will end by April 2007.
Results: Renal arteriography was performed in 967 pts. Angiographically evident ARVD was present in 252 pts (26.1%), with RAS ≥50% in 62 pts (6.4%) and <50% in 190 pts (19.6%); monolateral in 74.6% of pts. Demographic data are reported in the table. Coronary artery disease (CAD) was more severe in pts with significant RAS than in pts without ARVD, showing a significant higher prevalence of the three vessel disease (43.3% vs 20.2% P<0.001). All patients with significant RAS had at least a single vessel-CAD with 73.3% of them with 2- or 3- vessel CAD.
There were no complications related to renal artery disease screening.
Conclusions: The prevalence of renal artery stenosis >50% in an unselected cohort of pts undergoing cardiac catheterization was significant (6.5%). Our data support the role of renal arteriography in order to detect clinically silent ARVD during cardiac catheterization in patients with high CV risk.

Variables	No ARVD	RAS≥50%	P value
No. of Patients	715	62	
Age (yrs)	62±10.2	68.1±8.2	<0.001
Male sex, n (%)	522 (73%)	39 (62.9%)	NS
sCr (mg/dl)	0.9±0.3	1.2±0.5	<0.001
CrCl ml/min (Cockcroft & Gault)	90.1±30.3	66.4±30.9	< 0.001
Systolic BP (mmHg)	129.2±16.4	134.8±19	<0.05
Diastolic BP (mmHg)	77.5±10.1	76.6±9.9	NS
Antihypert. Drug Mean N°	1.6±1.2	2±1.1	<0.05
Hyperlipidemia (%)	72	92	<0.001
Diabetes (%)	33	44	NS
Smoking (%)	58	48	NS
Hypertension (%)	83	95	<0.05
History of CAD (%)	59	74.1	<0.05
History of Stroke (%)	5	5	NS
History of PVD (%)	10	31	<0.001
History of CRF (%)	3	19	<0.001

Furthermore, some clinical factors (older age, mild impaired renal function, blood pressure control, hyperlipidemia, coronary and peripheral atherosclerotic vascular disease) seem to be associated with severity of atherosclerotic renovascular disease.

FP187 HYPERURICEMIA ACTS AS AN INDEPENDENT PREDICTOR OF POOR GLOMERULAR FILTRATION RATE IN THE GERIATRIC POPULATION

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Introduction and Aims: Uric acid has been considered as a non-traditional risk factor of cardiovascular disease (CVD). Chronic kidney disease (CKD) patients have a high risk of CVD-related morbidity and mortality. Epidemiological evidences for the significance of hyperuricemia on the risk for kidney dysfunction is scarce, especially in the geriatric population. We hope to identify the possible relationship between hyperuricemia and renal function in the elder population.
Methods: All patients were older than 65 years visiting National Taiwan University Hospital for elder health examination during Jan. and Dec. 2003. We applied the Modification of Diet in Renal Disease (MDRD) equation 7 to estimate glomerular filtration rates (GFRs). Sex, age, body height, and body weight were recorded. All biochemistry data were measured in a single clinical laboratory. Linear regression model was applied to find factors that are independently associated with GFRs. Receiver operating characteristic (ROC) curve idnetify the cut-off values to predict advanced CKD (stage III to V).
Results: The study enrolled 491 men and 309 women with mean age (74.5±5.2), mean uric acid (6.2±1.5 mg/dL) and GFRs (87.8±18.5 ml/min/1.73m$^{2)}$. Age, serum uric acid, creatinine and BUN are negatively associated with MDRD-GFRs, but serum albumin and hemoglobin are associated positively. Stepwise regression identifies seven factors as an independent predictor for MDRD-GFRs (Table 1). Hyperuricemia acts an independent predictor for GFRs after adjusting conventional factors influent renal function. ROC curves identify uric acid greater than 6.75 mg/dL in men, and 5.95 mg/dL in women were the cut-off value to predict advanced CKD in the geriatric population (Figure 1).

Table 1. Predictors of glomerular filitration rate (GFR) in geriatric population: multivariate linear regression model with stepwise method

Predictive variables	Multivariate regression Regression coefficients (B)	(R2 for full model = 0.615) 95% CI for B	p value
Serum creatinine, mg/dl	-22.170	-24.632 to -19.708	<0.001
Serum blood urea nitrogen, mg/dl	-0.832	-1.006 to -0.659	<0.001
Male, vs. female	7.452	5.548 to 9.355	<0.001
Age, per year-old	-0.555	-0.712 to -0.397	<0.001
Serum uric acid, mg/dl	-1.657	-2.220 to -1.094	<0.001
Serum albumin, g/dl	6.146	2.854 to 9.437	<0.001
Serum total cholesterol, mg/dl	-0.029	-0.054 to -0.004	0.023

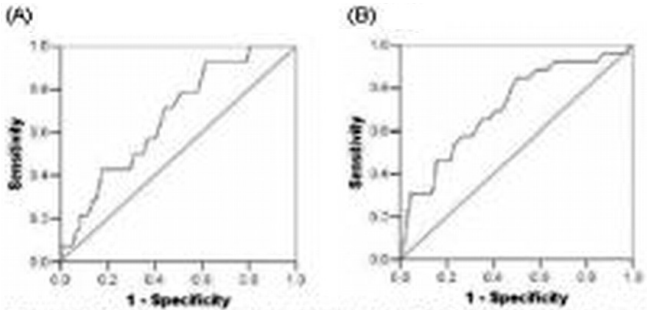

Fig. 1. Receiver operating characteristic (ROC) curve analysis of serum uric acid levels for the prediction of advanced chronic kidney disease (CKD) in geriatric (A) male population. Cut-off value of serum uric acid ≥6.75 mg/dL; sensitivity, 69.2, specificity, 56.6; and area under curve, 0.713 (95% Confidence interval, 0.609–0.816. (B) Female population. Cut-off value of serum uric acid ≥5.95 mg/dL, sensitivity, 50.0, specificity, 64.7, and area under curve, 0.671 (95% Confidence Interval, 0.545-0.795).

Conclusions: Hyperuricemia were independently associated with poor GFRs in the geriatric population. Whether hypouricemic therapy leads to renal protection in this CKD high risk population deserves further investigation.

FP188 CHOICE OF INITIAL MODALITY OF CHRONIC DIALYSIS TREATMENT AND EFFECT ON SURVIVAL

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Introduction and Aims: Several studies investigated the factors related to the chronic dialysis (CD) modality choice and the outcomes of patients starting with hemodialysis (HD), hemodiafiltration (HDF) and peritoneal dialysis (DP). However, few studies were performed using data derived from an area-based registry. The aim of the study is to evaluate the factors influencing the CD modality choice and the effect of first type of dialysis on patients' survival.
Methods: Prospective cohort study of 8122 undergoing chronic dialysis patients notified to Lazio Dialysis Registry (Italy) from 1-1-1995 to 31-12-2005. We performed a multinomial logistic regression to estimate determinants of choice of initial modality of CD, and a multiple Cox model to estimate mortality hazard ratios (HR).
Results: We observed 90.4% HD, 2.2% HDF, 7.3% DP as first dialysis modality; an older mean age in HD patients (64.2, SD 15.8), compared to HDF (55.6, SD 17.4) and DP (58.5, SD 18.6). A higher probability of initiation with HD compared both HDF and DP was found for: age >64 years (OR 3.50; 95%CI 2.40-5.11and OR 1.52; 95%CI 1.25-1.85), cancer (OR 2.59; 95%CI 0.94-7.13 and OR 1.88; 95%CI 1.17-3.04). A higher probability of initiation with HD compared to DP was found for vasculopathy (OR 1.40; 95%CI 1.04-1.88) and compared to HDF for women (OR 1.68; 95%CI 1.17-2.43). A higher probability of initiation with HDF compared to HD was found for coronary heart disease (OR 1.54; 95%CI 1.02-2.33) and congestive heart failure (OR 1.71; 95%CI 1.03-2.84) and compared to DP for HCV positive subjects (OR 2.16; 95%CI 1.14-4.09). A higher probability of initiation with DP compared both HD and HDF was found for patients with self-sufficiency (OR 2.12; 95%CI 1.67-2.69 and OR 2.09; 95%CI 1.33-3.29). A higher probability of initiation with DP compared to HD was found for coronary heart disease (OR 1.36; 95%CI 1.06-1.73) and hypertension (OR 1.47; 95%CI 1.22-1.76) and compared to HDF for women (OR 1.85; 95%CI 1.24-2.77) and age >64 years (OR 2.30; 95%CI 1.52-3.49). No difference in survival was found between patients starting with HD or HDF (HR 1.04; 95%CI 0.78-1.38) and DP (HR 1.10; 95%CI 0.94-1.29).
Conclusions: Our findings seems to suggest that evaluation of clinical condition and patient's autonomy are determinants of choice of initial modality of CD treatment. However, as we confirm no association between long-term survival and first dialysis modality, the preference of the patients should have more relevance in the choice of first type of CD treatment.

FP189 DOES AREA SOCIOECONOMIC STATUS (SES) PREDICT INCIDENCE AND RATE OF PROGRESSION OF CHRONIC KIDNEY DISEASE (CKD): A PILOT STUDY BASED ON A CLINIC POPULATION

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Introduction and Aims: Low socioeconomic status is associated with several chronic diseases, but evidence relating to CKD is scant. A few studies suggest that SES is an independent risk factor of progression of CKD and clinical outcomes. This pilot study attempts to explore the association of SES levels attributed to a geographical area (super output area) and CKD.
Methods: A study population of 458 diagnosed CKD patients was collected as a systematic sample (1 in 8 cases) from the total number of CKD patients being followed-up in the Sheffield Kidney Institute. Area level SES was classified using the Index of Multiple Deprivation 2004 (IMD 2004) which includes measures of income, employment, health and disability, education, skills and training, barriers to housing and services, living environment and crime. We also analysed the data from a subgroup of 104 patients with CKD (1 in 4 cases of 458 total populations) at baseline clinical and biochemical presentation of CKD and its progression rate.
Results: *Demographic characteristics.* Of this sample, 59% lived in the most deprived areas (fifth quintile by IMD), in whom 87% were white compared to 13% non-white (8% Asians,2% Caribbean,3% Somali). There was a higher number of males with CKD (61%). Overall 16% of patients were aged over 80years, 48% aged 61-80, 12% aged 41-60 and 23% aged 20-40. The distribution across deprivation quintiles was similar for all age groups, except for the 40-60 age group who were slightly more likely to be living in the most deprived areas. 37% of CKD patients were retired, 15% were unemployed or housewife, 10% were unskilled workers, 9% were professional or skilled worker, and 2% students.
Clinical and bio-chemical characteristics. Based on the subgroup with clinical data, the aetiology of CKD differed by age group. For patients over 40 years, commonest causes are type 2 diabetes, hypertension (HTN), possible analgesic nephropathy and for patients age between 20-40 years, most common causes are glomerulonephritis, vasculitis and HTN.
Overall, incidence of CKD by area-level SES, are 4 new cases per 1000 population for the most deprived areas (fifth quintile by IMD), and 3 per 1000 for the less deprived areas (third and fourth quintile by IMD) ($p<0.03$). Rate of progression was related to area deprivation, with progression more likely in patients from the most deprived area (73%) than overall (46%) ($p=0.01$).
Conclusions: Incidence and rates of progression were higher for patients from the more deprived areas. Further work is required to explore the individual level and area level explanations for these associations.

FP190 MORTALITY OF PATIENTS WITH CHRONIC KIDNEY DISEASE STAGES 1 TO 4 AFTER PERCUTANEOUS CORONARY INTERVENTION

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Introduction and Aims: Cardiovascular (CV) disease is leading cause of mortality in patients with end-stage renal failure and some recently published studies indicated that also chronic kidney disease (CKD) is associated with a higher risk for CV mortality.
The aim of our study was to determine the impact of different stages of CKD on mortality after percutaneous coronary intervention (PCI) in patients with acute coronary syndrome (ACS).
Methods: In our study 449 patients, 308 (68.6%) men and 141 (31.4%) women, with ACS after PCI were included. The mean age of included patients was 63±11.9 years (ranged from 22 to 96 years). In each patient, serum creatinine was determined and creatinine clearance was calculated using the Modification of diet in renal disease (MDRD) formula. According to the measured GFR patients were enrolled in to the different stages of CKD. The presence of arterial hypertension and diabetes was defined. Serum cholesterol (total, HDL and LDL) and triglycerides were measured by routine laboratory methods. Survival rates were analyzed using Kaplan-Meier survival curves. Cox regression model was used to assess the influence of variables that possible had an effect on CV outcomes.
Results: 103 (22.9%) patients had GFR > 89 ml/min/1.73m^2 (stage 1 of CKD), 228 (50.8%) GFR 60-89 ml/min/1.73m^2 (stage 2 of CKD), 104 (23.2%) GFR 30-59 ml/min/1.73m^2 (stage 3 of CKD) and 11 (2.4%) patients had GFR 15-30 ml/min/1.73m^2 (stage 4 of CKD). Patients were observed from the date of PCI until their death or from 425 to maximal 770 days. Kaplan-Meier survival analysis showed that mortality after PCI in patients with ACS increased with the stage of CKD. The risk for CV death was progressively higher from the patients with stage 1 to stage 4 of CKD. With Cox multivariable regression model only stages of CKD calculated with MDRD formula (P=0.001) and total cholesterol (P=0.018) turned out to be predictors of mortality in our patients.
Conclusions: In patients with ACS after PCI higher stage of CKD was associated with higher mortality of the patients.

FP191 TWO-YEAR COST-EFFECTIVENESS ANALYSIS OF LOW PROTEIN DIET SUPPLEMENTED WITH ESSENTIAL AMINO ACIDS IN PATIENTS WITH MODERATE TO SEVERE CHRONIC RENAL FAILURE

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Introduction and Aims: A recent Cochrane review of eight clinical trials including patients with moderate to severe chronic renal failure concluded that a reduced protein diet has the potential of delaying the need to start treatment with dialysis.
The objective of this analysis was to to evaluate the cost-effectiveness (cost per QALY gained) of low protein diet supplemented with essential amino acids compared with normal diet in patients with moderate to severe renal failure.
Methods: A Markov model was designed to evaluated renal failure progression for patients on either low protein or normal diet. The model was based on monthly probabilities to progress between three discrete health states: "pre-dialysis", "pre-dialysis" and "pre-dialysis". We estimated the average amount of time (months) spent in each health state, which in turn was used to estimate total costs and quality adjusted life years (QALYs) during the two year time perspective. The model was populated with data from various sources: the eight clinical studies in the Cochrane review (disease progression and mortality), the Swedish Association of the Pharmaceutical Industry (drug costs), a regional price list of health care, and from previous published studies (cost for dialysis and health related quality of life).
Results: Patients receiving low protein diet spent on average 21,7 months in "pre-dialysis", 1,9 months in "pre-dialysis", and 0,4 months as "pre-dialysis". The corresponding figures for patients receiving normal diet were 20,1, 3,3 and 0,6 months, respectively. The excess time of 1.4 month in pre-dialysis together with the reduced mortality resulted in 0.022 more QALYs (equivalent to 1.1 more weeks in full health) compared to patients on normal diet. The total average two-year cost for a patient receiving normal diets and low protein diet amounted to SEK 193 655 and 132 698, respectively. Hence the cost saving of low protein diet per patient amounted to SEK 60 687.
Conclusions: Low protein diet could be favourable not only for patients in terms of less time spent with dialysis and a better quality of life but also in terms of costs saved for the health care sector.

FP192 PROGRESSION OF CORONARY ARTERY CALCIFICATION IN PATIENTS WITH CHRONIC KIDNEY DISEASE. ROLE OF PHOSPHORUS BINDERS

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Introduction and Aims: Coronary artery calcifications (CAC) are more frequent in patients on dialysis (ESRD-patients) than in general population and rapidly proceed. Progression may cause further cardiovascular events. Greater prevalence and progression of CAC have been ascribed to exogenous calcium load consequent to high-calcium dialysate, and/or calcium containing phosphate binders (CCPB). Prevalence and progression of CAC have been recently reported to be greater in pre-dialysis patients than in normal subjects; progression was found to be correlated to phosphorus despite the majority of patients had normal concentration; fatal and not-fatal cardiovascular events occurred with manifest progression of CAC.
In ESRD-patients progression of CAC can be halted by a non-calcium containing phosphate binder (sevelamer, S) but not CCPB.
The present study was performed to assess the role of CCPB and S on the progression of CAC in patients with CKD not on dialysis (CKD-patients).
Methods: Consecutive out-patients (stage 3-4 CKD), homogeneous for age, biochemical variables and baseline TCS (mean TCS:320-470 Agatston Units) were randomized to receive S (1600 mg/day) or CCPB (calcium carbonate, 2 gr/day) throughout the study (18 months). In prior study these doses did not cause suppression of PTH and/or hypercalcemia. Treated patients exhibiting hypercalcemia or suppression of PTH exit the study. Agents affecting mineral metabolism were not allowed. Serum calcium, phosphorus, i-PTH, homocysteine, C-reactive protein, triglycerides, total cholesterol, high- and low-density lipoprotein cholesterol were measured every 3 months. Progression of CAC was assessed measuring total calcium score (TCS) by computed tomography. Scans were obtained at start (initial) and end of observation period (final). Data of patients treated with CCPB and S were compared with those of non-treated CKD-patients (Controls; C).
Results: Seventy-six patients were enrolled in three groups: C=n.27; CCPB=n.22; S=n.27.
Initial and final biochemical variables were unchanged but final TCS was significantly increased in three groups. TCS proceeded by 56% and 55% in patients treated with C and CCPB, respectively; and by 21% in those treated with S.
Mean TCS and annualized progression were not different between patients treated with CCPB and C. No episodes of hypercalcemia were encountered. PTH remained unchanged. Patients free from CAC at the start remained non calcified at the end of the study.
Conclusions: Progression of CAC is rapid in CKD-patients despite baseline normality of mineral metabolism parameters and not exogenous calcium load. Progression was greater in patients treated with CCPB and C but small in those treated with S. Study design and small number of patients did not allow to determine in which manner S contributed to the benefit on CAC progression. When prescription and reimbursement problem will be overcame, larger studies are mandatory to better establish the efficacy of S in reducing CAC progression and eventually morbidity and mortality in CKD-patients.

FP193 PREVALENCE OF HIV INFECTION IN DIALYSIS CENTRES IN SPAIN: PRELIMINARY RESULTS OF A SPANISH SURVEY (YEAR 2006)

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Introduction and Aims: The prognosis of HIV infection has improved with the widespread use of HAART. The aim of this study was to know the prevalence of HIV infection in Spanish dialysis patients and the clinical profile of the potential candidates for renal transplantation.
Methods: Prospective Spanish survey performed during the second trimester of 2006 using a standardized questionnaire to know the prevalence and characteristics of HIV infection in dialysis patients in Spain.
Results: 177 (48%) Spanish Dialysis centres have answered the ongoing survey. 28 centres have HIV infected patients (15'8%). There were 12899 patients included in dialysis programs: 11866 in hemodialysis (HD), 1017 in peritoneal dialysis (PD) and 16 in home-HD. HIV prevalence was 0.48% (63 HIV positive patients). Prevalence in HD, PD and home-dialysis programs was 0.42%, 1'2% and 0%, respectively. The 63 HIV-infected patients under dialysis (50 in HD and 13 in PD) were analysed. Mean (range) age was 46 (29-73) years. 66% of cases were males. HIV risk factors were: parenteral HIV exposure in 51% (former drug abuse 93%; blood transfusions and others 7%); high risk sexual behaviour in 30% (heterosexuality 58% and homosexuality 42%), multiple risk factors in 4.7% and unknown in 14.3%. Mean (range) time from HIV infection was 11.5 (1-26) years and time on dialysis was 4.9 (1-26) years. The most frequent aetiology of end-stage renal disease were glomerulonephritis (35%) followed by diabetes mellitus (15%). 25% of the diagnosis were proven by biopsy. Nine patients (14%) were in renal transplant waiting list. 43% of the patients had previous AIDS defining events and 85% were under HAART regimens. The median (range)

CD_4 T-cell count was 335 cells/mm^3 (16-845). 77% had undetectable viral load. 64% and 5'4% of patients have coinfections with hepatitis C and B viruses, respectively. 29% of patients have diabetes mellitus and 27% had previous cardiovascular events.
Conclusions: HIV seroprevalence in Spanish dialysis patients is 0.48%, being higher in PD than in HD. There are a high percentage of patients with hepatitis C coinfection, diabetes mellitus and previous cardiovascular complications. Most of the patients are in an immunological and virological good situation and under HAART regimens. Some patients are in the renal transplant waiting list.

FP194 RELATIONSHIP BETWEEN VITAMIN D STATUS, PARATHYROID HORMONE LEVELS AND BONE MINERAL DENSITY IN PATIENTS WITH CHRONIC KIDNEY DISEASE STAGES 3 AND 4

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Introduction and Aims: Low vitamin D status is associated with secondary hyperparathyroidism and increased bone turnover in the general population and can aggravate the hyperparathyroidism of chronic kidney disease (CKD) patients. It is also correlated to low bone mineral density (BMD), but this correlation is less clear in CKD patients. Aims of our study were to investigate these associations in CKD stages 3 and 4 patients, and to identify significant predictors of BMD in this population.
Methods: Serum 25-hydroxyvitamin D levels (25OHD), BMD at the femoral neck (FN) and radius, and bone mineral metabolism parameters were measured in 89 CKD stages 3 and 4 patients. Patients with prior parathyroidectomy or who had received medication known to affect BMD, 25OHD or parathyroid hormone (iPTH) levels were excluded. Vitamin D status was defined as follows: serum levels between 40 – 75nmol/L= insufficiency, < 40nmol/L= deficiency and ≤ 12nmol/L= severe deficiency.
Results: Mean 25OHD levels were 53.8±32.1 nmol/L and correlated to the severity of proteinuria. Thirty-five patients (39%) had vitamin D insufficiency, 29 (33%) had vitamin D deficiency and 5 (6%) severe deficiency. Of the 89 patients, 2 had osteoporosis and 31 had osteopenia either at femur or radius. Thirty-five patients had low vitamin D and iPTH above target for the stage of CKD and should require vitamin D supplementation according to NKF/KDOQI guidelines, but 27 of them had Ca above 2.37 mmol/L that is the threshold for vitamin D therapy.
In the multiple linear regression analysis, independent predictors for the FN T score were the iPTH levels (β= -0.36, $P< 0.001$) and the body mass index (β= 0.33, $P= 0.001$), for the model: adjusted $R^2= 0.196$, $P< 0.001$. For the radius T score independent predictor was only the severity of proteinuria (β= -0.28, $P= 0.008$). Serum 25OHD levels were not directly associated with BMD, but they were independent predictors of iPTH (β= -0.32, $P= 0.001$), along with the estimated glomerular filtration rate (β= -0.37, $P< 0.001$) and the Ca levels (β= -0.2, $P= 0.024$), for the model: adjusted $R^2= 0.339$, $P< 0.001$.
Conclusions: Vitamin D insufficiency and deficiency are very common in CKD stages 3 and 4 population and may indirectly affect (through increase in iPTH), the bone mineral density of these patients. Further studies are needed to examine the impact of correction of vitamin D insufficiency and deficiency on iPTH levels, BMD and fracture risk in CKD population. Limitation of treatment may be the hypercalcaemia of these patients, especially if the NKF/DOQI guidelines are to be followed.

FP195 HEPATITIS C VIRUS INFECTION IMPAIRS HEALTH-RELATED QUALITY OF LIFE IN HEMODIALYSIS PATIENTS

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Introduction and Aims: Health-related quality of life (HRQOL) is impaired in hemodialysis (HD) patients. Hepatitis C virus (HCV) infection has negative impact on HRQOL in patients with normal renal function. However, HRQOL of HCV positive and negative HD patients was not compared specifically. We compared HRQOL of HCV positive and negative HD patients by using Short Form 36 (SF-36).
Methods: Patients performed SF-36 and Beck Depression Inventory (BDI). Hemodialysis dose was evaluated by single-pool Kt/V (spKt/V). Previous transplantation history, economical, marital and educational statuses, presence of coronary artery disease, diabetes and sleep disturbance was noted and laboratory parameters were recorded.
Results: Totally 173 patients (male/female: 112/61, age: 49.9±14.2 years, HD duration: 107.1±67.1 months) were included. Eighty-four were HCV positive, 89 were HCV negative. Hemodialysis duration (141.5±68.9 months vs 75.4±47.0 months, $p:<0.0001$), BDI scores (23.1±8.9 vs 20.3±10.1, p: 0.036), aspartate aminotransferase, (19.7±15.0 U/L vs 14.2±7.1 U/L, p: 0.002), alanine aminotransferase, (23.6±24.0 U/L vs 14.3±10.8 U/L, $p<0.0001$) were higher, low density lipoprotein cholesterol (87.6±31.9 mg/dl vs 101.3±34.0 mg/dL, p:0.007) was lower in HCV positive patients when compared to HCV negative patients. Other biochemical parameters were not different between HCV positive and HCV negative patients. After adjusting for age, HD duration, spKt/V, BDI scores, transplantation history, economical, marital and educational statuses, coronary artery disease, diabetes and sleep disturbances, the results of HRQOL showed that HCV positive patients had worse scores in four subscales of SF-36 namely; general health (36.9±2.1 vs 44.6±2.0, p:0.016), physical functioning (51.4±3.2 vs 64.3±3.0, p:0.007), physical role (34.6±5.5 vs 51.8±5.2, p:0.036) and vitality (38.8±2.4 vs 48.2± 2.3, p:0.011) when compared to HCV negative patients.
Conclusions: HCV positive hemodialysis patients tended to have higher depression scores than HCV negative patients. HCV infection seemed to have a negative effect on the health related quality of life in hemodialysis patients independently.

FP196 RISK FACTORS OF INCREASED ATHEROGENICITY AND WATER OVERLOAD DURING CHRONIC KIDNEY DISEASE PROGRESSION ALSO REFLECT CARDIAC REMODELING

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Introduction and Aims: Cardiovascular morbidity is increasing along with the progression of chronic kidney disease (CKD). This is due to the presence of traditional risk factors together with other factors that relate to renal failure itself. The aim of this study was to investigate the behavior of fibrinogen, apolipoprotein-A1 (apo-A1) and brain natriuretic peptide (pro-BNP) in the course of CKD progression and their relation to cardiac changes detected on echocardiogram.
Methods: In a cross-sectional observation, a population of 223 steady patients with CKD stages1 to 4 and a "high-risk" population with normal renal function from the out-patient clinics of two hospitals were studied with echocardiogram and apo-A1, fibrinogen and pro-BNP were measured in 223, 222 and 114 patients respectively and correlated to the echocardiographic findings.
Results: Increased fibrinogen levels and decreased levels of apo-A1 are found in atherosclerotic disease. In our study CKD progression was found to correlate positively with an increase in fibrinogen levels ($p<0,000$) and negatively with the levels of apo-A1 (p=0,005). CKD progression was also found to correlate positively with an increase in pro-BNP levels ($p<0,000$), probably reflecting the inability of the kidneys to maintain water and sodium balance leading to overload.
Interestingly, all three risk factors correlated also with cardiac changes detected on echocardiogram. Fibrinogen correlated positively with LV-mass/BSA ($p<0,000$), relative wall thickness (RWT) ($p<0,000$), intraventricular septum (IVS) ($p<0,000$) and posterior wall (PW) ($p<0,000$). Pro-BNP levels also correlated positively with LVmass/BSA ($p<0,000$), with end-diastolic (p=0,035) and end-systolic diameter of the LV (p=0,025).In contrast, Apo-A1 showed a negative correlation with LVmass/BSA (p=0,02), RWT (p=0,009), IVS (p=0,028) and PW (p=0,001).
Conclusions: In conclusion, the increase of fibrinogen levels and the

decrease of apo-A1 levels during CKD progression reflect the increased atherogenicity seen in chronic renal failure, along with significant changes in cardiac structure. Additionally, the increase in pro-BNP levels probably reflects the inability of the kidneys to excrete water and sodium overload and this leads to an increase in LVmass resulting to LV dysfunction with an increase in LVEDD and LVESD.

FP197 ECHOCARDIOGRAPHIC EVIDENCE OF EARLY CARDIAC REMODELING DURING CHRONIC KIDNEY DISEASE PROGRESSION

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Introduction and Aims: The prevalence of cardiovascular disease (CVD) in chronic kidney disease (CKD) has been studied in a series of studies. Up to 80% of patients with end-stage renal failure have abnormal echocardiographic findings and this marks a prejudged course of these patients characterized by an increased CV morbidity and mortality. The aim of this study was to investigate the time point in the course of CKD that cardiac remodeling is detectable, so that early interventions will be possible as well as effective in reversing cardiac damage and by this limiting CV risk.
Methods: For this purpose, in a cross-sectional observation 211 steady patients with CKD stages1 to 4 from the out-patient clinics of two hospitals were studied with echocardiogram. There were 105 males (49.8%) and 106 females (50.2%) and their mean age was 64±12 years old. Primary renal diseases were hypertensive nephrosclerosis 34 (16%), diabetes 30 (14%), interstitial nephritis 23 (11%), glomerulonephritis 19 patients (9%), and in 62 patients (29%) the PRD was unknown. The distribution of the patients in the CKD stages were, CKD 1: n=29 (13.7%) with a mean GFR 118±37 ml/min (Cockcroft), CKD 2: n=55 (26.1%), mean GFR 76±8 ml/min, CKD 3: n=75 (35.5%), mean GFR 42±8 ml/min and CKD 4: n=44 (20.9%), mean GFR 24±4 ml/min.
Results: CKD progression was found to correlate positively with an increase of left ventricular after adjustment to body surface area LVmass/BSA (stage 1=112 g/m^2, stage 2=131 g/m^2, stage 3=142 g/m^2 and stage 4=169 g/m^2, p<0,000). This represented an increase by 17%, 27% and 51% in LVmass/SA in stage 2, 3 and 4 respectively from stage 1.
Significant increase as CKD was progressed was also observed in relative wall thickness (p=0,007), intraventricular septum (p=0,023), posterior wall (p=0,006) and in left ventricular end-diastolic diameter (p=0,031). In contrast, ejection fraction, fraction shortage and LVESD did not correlation significantly with CKD progression.
Conclusions: In conclusion, the progression of CKD stages was followed by a significant remodeling of the heart geometry. Therefore, the well-established cardiac burden and cardiac remodeling in CKD seems to be a progressive procedure starting from the early stages. These findings should prompt early detection as well as proper interventions from the very early stages of CKD when the structural changes in heart geometry are still subclinical and probably reversible.

FP198 PREVALENCE AND CROSS-SECTIONAL ASSOCIATIONS OF A REDUCED ESTIMATED GLOMERULAR FILTRATION RATE IN THE OVER-75 YEAR OLDS

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Introduction and Aims: Chronic kidney disease (CKD) can be classified by reduction in the estimated glomerular filtration rate (eGFR). Because the glomerular filtration rate decreases with age, the clinical significance of reduced eGFR in older people is uncertain.The aims of this study were to assess the frequency of CKD in people aged 75 and above, and to evaluate the associations of different levels of eGFR with morbidity and functional status.
Methods: Cross sectional study of people aged 75 and over participating in a cluster randomised trial of health and social assessment of older people in the community between 1994-8 in the UK. There were 13109 (87%) participants in 53 general practices who had a serum creatinine measured in local laboratories at baseline. eGFR was derived from the Modification of Diet in Renal Disease formula (MDRD). Prevalence of different CKD stages was calculated stratified by age and gender. Multiple logistic regression was performed to test for associations with morbidity and functional status adjusting for age and gender.
Results: Prevalence of CKD for eGFR<60 was 56.1% (95%CI 55.3-57.0%), for eGFR <45 17.7% (95%CI 17.1-18.4), and for eGFR<30 2.7% (95% CI 2.4-2.9). Prevalence of all stages of CKD was higher in older groups, females, and those with cardiovascular co-morbidity and diagnosed hypertension but not diabetes. The associations with measures of morbidity and functional impairment increased as eGFR fell, especially once eGFR was <45. For example the odds ratios in females for anaemia for eGFR <30 and 30-44 and 45-59 vs reference GFR>60 were 5.69 (4.00-8.12), 1.51 (1.12-2.02) and 1.10 (0.87-4.41) respectively; similar figures for falls at home and poor physical activity were 1.50 (1.03-2.19) and 2.84 (2.16-3.74), 1.36 (1.14-1.62) and 1.38 (1.17-1.62), 1.06 (0.90-1.26) and 1.00 (0.87-1.16) respectively.
Conclusions: Stage 3-5 CKD is very common in older people. An eGFR below 45 identifies a smaller sub-group of older people who are more likely to have significant comorbidity, impaired functional state, and potentially reversible consequences such as anaemia. The benefits of identifying older people with eGFR >45 need to be determined.

FP199 STANDARDISING ESTIMATED GLOMERULAR FILTRATION RATES (EGFR): DO LABORATORY METHODS REALLY MATTER IN PRACTICE?

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Introduction and Aims: Chronic kidney disease (CKD) guidelines have focused on the utility of the modified 4-variable MDRD equation (traceable by isotope dilution mass spectrometry IDMS). This formula accounts for variance in creatinine measured by an analyser different to that used when the original MDRD equation was devised.
To assess theoretically and in practice the effect sizes of IDMS correction over the 4-variable MDRD equation in eGFR calculation with a range of UK creatinine methods and the subsequent impact of this on CKD prevalence.
Methods: MATLAB was used to generate a range of creatinine data (30-300umol/l) for male and female patients aged 20-100 years. The maximum differences between the IDMS and MDRD equations for all 14 UK laboratory techniques were explored with an averaged (IDMS + MDRD)-eGFR less than 60mls/min and also 30mls/min. Similar procedures were applied to 712,540 samples (reflecting 5 creatinine methods in Northern Ireland), belonging to patients 18 years+, to explore graphically maximum differences in techniques. CKD prevalence using both estimation equation was compared.
Results: Simulated creatinine data indicates that the majority of creatinine procedures in the UK demonstrate small differences between the IDMS and MDRD methods in stages 4 and 5 CKD (where the averaged maximum difference for all laboratory methods was 1.27mls/min for females and 1.59mls/min for males). The MDRD equation deviated furthest from the IDMS results for the Endpoint Jaffe method: the maximum difference of 9.93mls/min for females and 5.42mls/min for males occurred at extreme ages and in those with eGFR reflecting stage 3 or higher disease. The real data graphically agreed with the theoretical results.
Using existing data 93,870 patients yielded a first MDRD eGFR<60mls/min in 2001. 66,429 (71%) had a second test >3months later of which 47,093 (71%) continued to have an eGFR<60mls/min. This resulted in an estimated

crude prevalence of 3.97% for laboratory detected CKD in adults using the MDRD equation which reduced to 3.69% when applying the IDMS equation. Over 95% of this difference in prevalence was explained by older females with stage 3 CKD with data close to the stage 2 interface reemphasizing the need for further research into the subcategorisation of stage 3 CKD.
Conclusions: Improved accuracy of eGFR is obtainable by using IDMS corrected eGFR especially in early stage CKD; however our data suggests this will have little practical impact on stages 4-5 considering the current referral guidelines.

FP200 LEFT VENTRICULAR HYPERTROPHY IN PREDIALYSIS CHRONIC KIDNEY DISEASE: IMPACT OF CARDIOMUSCULAR BIOMARKERS

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Introduction and Aims: Cardiovascular disease is a major cause of death in patients with advanced stages of chronic kidney disease (CKD), including dialysis patients. Left ventricular hypertrophy (LVH) is an independent predictor of mortality and morbidity in patients with end-stage renal disease and is present in over 70% of patients commencing dialysis. However, only a few studies of LVH are available about the patients before the start of dialysis treatment. The purpose of this study is to evaluate the prevalence and clinical correlates of LVH in patients with advanced stages of CKD.
Methods: We performed a cross-sectional study of 92 patients (48 men; mean age 64±9 (34-87) years) with renal diseases but history of neither cardiovascular diseases nor arrhythmia. The mean creatinine clearance was 19.3±8.0 mL/min. We calculated left ventricular mass index (LVMi) using the American Society of Echocardiography cube formula method regressed to anatomic validation. LVH was difined as LVMi greater than 131g/m^2 in men and greater than 100g/m^2 in women. Circulating levels of human atrial natriuretic peptide (hANP) was measured as a cardiovascular biomarker.
Results: LVH was present in 54% of the population studied. The prevalence of LVH is significantly increased with progression of renal decline: 21% in stage 3, 40% in stage 4, and 71% in stage 5 ($P < 0.001$). Univariate analyses revealed that creatinine clearance, hemoglobin, systolic blood pressure hANP, and intact PTH ($P < 0.01$). Stepwise logistic regression analysis demonstrated that hANP is selected as the independent risk factor.
Conclusions: LVH is highly prevalent in patients with advanced stages of CKD, which is associated with severity of renal impairment. hANP is identified as a modifiable factor as predictor of LVH. We suggest that strict control of body fluid could prevent the progression of LVH, and as a result, could attenuate the risk of cardiovascular events in CKD.

FP201 DETECTION OF CHRONIC KIDNEY DISEASE IN "HEALTHY" ELDERLY PEOPLE

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Introduction and Aims: Renal function physiologically decreases with age; on the other hand, elderly population is increasing dramatically among ESRD patients. Frequently, a reduced renal function in the elderly is attributed to normal ageing, and other causes are not investigated; thus, an good opportunity to identify and treat renal disease at early stages is lost. Few renal function data in apparently healthy elderly people have been published. Therefore, the aim of this study was to determine the prevalence and presence of renal disease risk factors in people older than 60 years otherwise considered as healthy.
Methods: We included subjects older than 60 years, considered as "healthy" and assisting to a program to prevent chronic diseases (PREVENIMSS) in a Primary Health-Care Unit (UMF 34). Individuals with transient albuminuria, or any documented or strongly suspected renal, urinary or systemic disease affecting renal function (particularly diabetes and hypertension) were excluded. All subjects were evaluated for microalbuminuria (microAlbU) by dipstick (micraltest II®) in the first voiding urine sample; in 24-h urine collections, albuminuria was quantitatively measureed by nephelometry. Nephropathy was defined as presence of albuminuria, indepently of GFR, or presence of a GFR <60 mL/min/1.73m^2, independently of albuminuria.
Results: Eighty-two subjects, aged 67±6 years, have been evaluated. From the total, 5% had microAlbU and 7% had a reduced GFR; considering both variables, 12% of the evaluated population had nephropathy (early nephropathy in all cases). The presence of macroAlbU or GFR <30 mL/min/1.73m^2 was not observed. Results of renal function are shown in the table. Although no significant differences were observed comparing subjects with normal function vs those with nephropathy, the latter tended to be older (70±7 vs 67±6 years), had higher diastolic blood pressure (78±5 vs 67±6 mmHg) and higher proportion of males (44% vs 35%) than those with normal renal function. No differences in the use of non-steroidal anti-inflammatory drugs were found between groups, but a high frequency in the use of these drugs was observed in both subjects with and without nephropathy (75% vs 73%).

GFR (ml/min/1.73 m^2)	Prevalence (%)	Albuminuria	
		NO	YES
≥90	23	18	1
60-89	70	54	3
30-59	7	6	0
Total (%)	100	95	5

Conclusions: The percentage prevalence of early renal disease in subjects older than 60 years, otherwise considered as healthy in our setting, was 12%, whereas the presence of isolated microAlbU was 5% and reduced GFR was 7%. Individuals with nephropathy, tended to be older, have higher diastolic blood pressure and higher male sex proportion compared to those with normal renal function.

FP202 PRESENCE AND RISK FACTORS OF CORONARY ARTERY CALCIFICATION IN PATIENTS WITH AND WITHOUT DIABETES AND CHRONIC KIDNEY DISEASE STAGES 3 AND 4

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Introduction and Aims: In the general population the presence and extent of coronary artery calcification (CAC) have been used for the non-invasive diagnosis of coronary artery stenosis and for prognostic purposes. Studies in chronic kidney disease (CKD) patients, especially in end stage renal disease, have reported extremely high CAC prevalence with CAC scores up to ten times higher than expected for age and sex. The presence of diabetes seems to increase the risk of CAC, however to date no direct comparisons have been reported between CKD patients with and without diabetes. Aim of this study was to describe the prevalence and extent of CAC in CKD stages 3 and 4 patients comparing patients with and without diabetes and identify risk factors. Another aim of the study was to determine if the presence of peripheral artery calcification (PAC) would assist in identifying patients positive for CAC.
Methods: A cross-sectional study was carried out in 112 patients of both sexes, aged between 18-65 years with CKD stages 3 and 4, 54 with and 58 without diabetes, all asymptomatic for heart disease. CAC was detected by multi-slice computed tomography (MSCT), and PAC by plain foot radiography. Demographic and laboratory data were also collected and analysed.
Results: Prevalence of CAC was 74% and 46.5% in CKD patients with and without diabetes respectively (40/54 vs. 27/58, P= 0.003) and the two groups were matched for age and sex. In the multivariate analysis for the whole group, age, diabetes and obesity were the major predictors of CAC. Patients with diabetes had higher CAC scores [159 (1-4074) vs. 47 (2-1196), P= 0.002], with more vessels affected [3 (1-5) vs. 2 (1-5), P= 0.03], and in the presence of diabetes men and women had the same risk for CAC. Severity of renal dysfunction was a predictor of CAC in the

patients without diabetes, but not when diabetes was present. Smoking was associated with the extent of CAC, especially in patients with diabetes. Phosphate levels were predictive of CAC in patients without diabetes, and parathyroid hormone levels were associated with the extent of CAC in the non-diabetic population and when all CKD patients were considered.
The presence of PAC on plain radiography identified patients with CAC on MSCT, with a sensitivity of 73%, a specificity of 28%, a positive predictive value of 44% and a negative predictive value of 76% indicating that it was not an adequate alternative screening marker for identifying patients with CAC.
Conclusions: CAC is common in CKD stages 3 and 4 patients, especially in those with diabetes. Further studies are needed to establish if lifestyle modifications (smoking cessation and weight management) and therapeutic strategies targeting iPTH and phosphate, can affect the prevalence and severity of CAC, delay its progression and finally reduce the very high cardiovascular disease risk seen in CKD patients.

FP203 FACTORS INFLUENCING EXERCISE PROTEINURIA IN YOUNG HEALTHY PERSONS

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Introduction and Aims: The intensive physical activity is known as a cause of benign proteinuria. Although in the literature exist some studies describing exercise proteinuria (EP) the explanation of this phenomemon is not fully explained. The aim of the study was to estimate frequency of EP among healthy young participants of long distance march.
Methods: 115 participants of March on Orientation "Harpagan", all amateurs, who took at least 50-km walk in the forest had performed urinanalysis with test strips.
Results: 1. EP was found in 26 persons (22,6%), in all cases values reaching 30mg/dl. 2. There was no correlation between presence of EP and age of participants and durations of exercise. Specific gravity (SG) and pH of urine, as well as frequency of erytrocyturia and bilirubinuria were similar in both groups. Ketonuria was more frequent in participants with EP (tabl.1). 3. Ketones were found in 75 participants (65,2%). There was not difference between participants with or without ketonuria with reference to age, gender and duration of exercise. Those with ketonuria had higher SG and lower pH of urine, proteinuria was common (tab. 2). 4. 54 participants answered questionnaire concerning diet and time of recovery. Participants with ketonuria took less fluids and kalories and were more exhausted after march than those without ketones in urine.

The characteristic of persons with and without proteinuria

Proteinuria	Mean age	Women	Duration of exercise	SG of urine	Ketones	pH of urine
Yes	29,3y	12%	14,6h	1025	88,5%	5,4
No	27,8y	10%	15,6h	1023,3	58,4%	5,8

The characteristic of persons with and without ketonuria

Ketones	Duration of exercise	SG of urine	pH of urine	Proteinuria	Food intake during exercise (kcal)	Fluids (L)	Time to recovery
No	15,37 h	1019	6,2	7%	2169,79	2,85	1,14 days
Yes	15,32 h	1026,26	5,44	30,67%	1940,54	2,49	1,72 days

Conclusions: Some interesting conclusions can be drawn from this very simple study. 1. After long exhausting march proteinuria occurs only in 20% of young healthy persons. 2. EP is alwalys at minimal range (30mg/dl). 3. Presence of EP is not correlated with duration of exercise but rather with improper diet and may be improper training.

FP204 THE RELATION BETWEEN INSULIN RESISTANCE AND ANTHROPOMETRIC VALUES IN NONDIABETIC HAEMODIALYSIS PATIENTS

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Introduction and Aims: It has been known the role of hyperinsulinemia in inflammatory process and its association with anthropometric measurements. We aimed to identify that in nondiabetic haemodialysis (HD) patients, which anthropometric values are related most closely to insulin resistance (IR).
Methods: Five-two nondiabetic HD patients aged 47.7±14 (22-75) were enrolled. Each subject's weight, height, waist, hip and arm circumference, biceps and triceps skin fold were measured; body mass index (BMI) and waist to hip ratio were calculated. Percentage of body fat was analyzed by bioelectrical impedance. In fasting blood samples, complete blood count, insulin, glucose, uric acid, albumin, transferrin, ferritin, HsCRP were measured. IR was calculated by homeostasis model assessment (HOMA) and cut-off point was accepted 2.7.
Results: Of all patients 14 (26.9%) were female, 38 (73.1%) were male. Mean duration of HD was 59.1±42.9 month (2-170), 13 (25.5%) patients had overweight and obesity (BMI >25 kg/m^2), 16 (30.8%) had increased body fat (female ≥33%, male ≥22%), 22 (42.3%) had IR.
Serum level of insulin and HOMA index were significantly correlated with BMI (r=0.32, p=0.023; r=0.28, p=0.048, respectively) and arm circumference (r=0.32, p=0.024; r=0.28, p=0.046, respectively). Hip circumference was only associated with the level of insulin (r=0.32, p=0.029). Other anthropometric measurements did not relate to insulin level and HOMA index.
BMI, hip and arm circumference in patients with IR were significantly more than the other (p=0.031, p=0.008, p=0.037; respectively). Lymphocyte count in this group was less (p=0.036). The levels of uric acid, albumin, transferrin, ferritin and HsCRP did not differ between groups.

The correlation between anthropometric measurements with serum insulin level and HOMA index

	Serum insulin level		HOMA index	
	r value	p value	r value	p value
Body mass index	0.32	0.023	0.28	0.48
Percentage of body fat	0.21	NS	0.19	NS
Waist circumference	0.24	NS	0.21	NS
Hip circumference	0.32	0.029	0.27	NS
Arm circumference	0.32	0.029	0.28	0.046
Biceps skin fold	0.16	NS	0.13	NS
Triceps skin fold	0.11	NS	0.09	NS

HOMA: Homeostasis model assessment.

Conclusions: Regarding to IR, in nondiabetic HD patients, BMI and arm circumference are more important anthropometric measurements.

FP205 ULTRASONOGRAPHIC RENAL DIMENSIONAL PARAMETERS HELP PREDICT RENAL OUTCOME IN PATIENTS WITH CHRONIC RENAL INSUFFICIENCY

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Introduction and Aims: Ultrasonography (US) of the kidney and urinary tract has become the primary modality for the evaluation of urinary diseases since number, location, size and shape of the kidneys, and the collecting system are accurately assessed. It has been shown that renal length and volume are correlated with age and body weight (BW), so that a variability of 5% is present in adults. Since renal length, volume and echogenicity are considered potential surrogate markers of single kidney function, US has been proposed as a screening modality to evaluate patients with chronic renal insufficiency (CRIpts). However, as yet, no study has specifically evaluated the correlation between renal US parameters and GFR levels when age, BW, BP and other parameters supposed to be correlated to GFR are simultaneously considered.

Methods: Aim of the study is to verify the relationship between renal US and functional parameters in CRIpts (135 pts, stage 2-4 KDOQI) and in a control population (C: 315 healthy volunteers from the staff of two local hospitals). The same sample was evaluated after a two-year follow-up.
Results: *Basal study*. Mean age was 49.8±13 yrs, 47.22% male. Arterial hypertension was found in 63.7% of CRI pts and in none of C. Mean serum creatinine was 1.11 mg/dL in C group (ranging 0.67-1.23) and 3.75 mg/dL in CRF group (ranging 1.8-7.7). As compared to C, CRI pts presented significantly reduced the renal longitudinal diameter and volume in all CRI stages, while the transversal diameter and cortical thickness were significantly reduced only in pts with stage 3 and 4.
Follow-up. Observation lasted 24±2 months. CRF pts were divided in 4 quartiles according to their basal renal volume. In CRF group 23 pts presented 1 or 2 event failure (reduction >30% of basal GFR and/or start of hemodialysis) and 14 died (3 of these had started RDT). The relationship between these events and clinical, laboratory and US parameters was evaluated by calculating the hazard ratio for unit increase. Reduction of cortical thickness (in III and IV quartiles) and kidney volume (in all quartiles) were identified as risk-factors, as well as the increases in SBP (in all quartiles), DBP(in IV quartile), CaxP product, PTH (in III and IV quartiles), CRP and daily proteinuria in all quartiles. By contrast, normal serum albumine and Hb levels were identified as protective factors. By multivariate analysis, we showed that the every 10 cm^3 of kidney volume reduction there is an increase of 18% of risk-events in C vs 38% in CRF pts. The reduction of cortical thickness increases the risk of events by 2% in C vs 21% in CRF patients. Both the risk of progression to ESRD and death were inversely related to the kidney volume ($p<0.001$ for both the events) at baseline.
Conclusions: Our data establish important correlation of US dimensional parameters with decline-rate of GFR and other non- or traditional risk factors in course of CRI. The simultaneous combination of morpho-dimensional and functional parameters could help to improve the accuracy of the follow-up in patients with CRI, with possible therapeutical and prognostic implications.

FP206 RENAL INSUFFICIENCY IN BONE METASTASIS CANCER PATIENTS: PREVALENCE AND IMPLICATIONS ON ANTICANCER DRUGS MANAGEMENT. SUBGROUP ANALYSIS OF THE IRMA STUDY

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Introduction and Aims: The IRMA study reported the high prevalence of renal insufficiency (RI) in 4684 solid tumour patients, with a glomerular filtration rate (GFR) <90 ml/min for 50-60%. Furthermore, 80.1% were receiving nephrotoxic anticancer drugs and 79.9% drugs necessitating dosage adjustment. We present the results for IRMA patients with bone metastasis (BM).
Methods: Subgroup analysis of IRMA patients with BM. Data collected: sex, age, weight, serum creatinine (SCR), bone metastasis (BM) and anticancer drugs. The prevalence of SCR>110 µmol/L was assessed. GFR was estimated with Cockcroft-Gault (CG) and abbreviated MDRD (aMDRD) formulae. Drugs necessitating dosage adjustment and those potentially nephrotoxic were identified. Chi-square test was used to compare the prevalence of RI between patients with BM and patients without, for all patients and for breast cancer (BC) ones.
Results: 1000 patients (BC 577) with BM were included: median age 60, mean 59.8, weight 66 kg, 659 women. The prevalence of SCR>110 µmol/L was 8.3%. That of GFR<90 ml/min was 57.9% with CG and 54.7% with aMDRD. 83.4% of treated patients received at least one drug needing dosage adjustment (or no data) and 69% received at least one nephrotoxic drug. The prevalence of RI was not statistically different between patients with or without BM. However, the prevalence of RI was significantly higher in BC patients with BM as compared to BC patients without BM (62.1 versus 56.7%, p=0.04).

RI stages in IRMA patients with bone metastasis according to K/DOQI-K/DIGO classification

Stage of RI	GFR (mL/min or mL/min/1.73m^2)	CG	aMDRD
Stage 1	>=90	34.1	38.3
Stage 2	60-89	36.4	41.7
Stage 3	30-59	19.9	11.4
Stage 4-5	<30	1.6	1.6
Data not available		8	7

RI: Renal Insufficiency; GFR: Glomerular Filtration Rate; CG: Cockcroft-Gault

Conclusions: RI is highly frequent in cancer patients with BM. Appropriate evaluation of renal function necessitates CG or aMDRD calculation. In those patients, and especially in breast cancer patients with BM, anticancer drugs should be cautiously selected regarding their potential renal toxicity and need for dosage adjustment.

FP207 BIOPSY IN OLDER PATIENTS. IT IS RECOMMENDED?

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Introduction and Aims: During the last three decade (1974-2004), the percentage of patients older than 65 years who have been diagnosed by renal biopsy have increased progressively: 1974-1984: 6.8%; 1984-1194: 19.49%; 1994-2204: 24.78%.
Methods: In this period of time we have performed 1922 renal biopsies of native kidney in our centre.
Results: 60.5% Male/39.5% Female.320 patients (16.64%) were equal or older than 65 years (group A). 1602 (83.36%) were younger than 65 years (group B). Kidney biopsy in group A were taking in 39% because of nephrotic syndrome, in 33% due to rapidly renal insufficiency and in 11% due to nephrotic proteinuria range. In group B were significantly lower (17.7%;3.35%;17.3%). The final diagnosis is showed on table 1.

Table 1

	>65 y Group A	<65 y Group B	p
Vasculitis	17.8	2.71	p<0.05
Amiloydosi	6.66	2.05	p<0.05
Renal myeloma	4.12	0.58	p<0.05
Membranous nephropathy	10.5	8.47	ns
Focal segmentary scle	9.2	16.28	p<0.05
IgA nephropathy	6.6	19.44	p<0.05

Conclusions: Age of patients is cause of worsening renal function and also is accompanied of higher incidence secondary nephropathies. A high number of this secondary nephropathy could be treated effectively, for this reason we believe that renal biopsy must be performed even in older patients.

FP208 CARDIOVASCULAR IMPLICATIONS OF COMMUNITY BASED DETECTION OF REDUCED GFR

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Introduction and Aims: Chronic kidney disease is an asymptomatic condition managed by primary care physicians. We think that the use of Primary Healthcare Information System (OMI –AP, Stacks, Madrid community) and outpatients' laboratory database to identify people with low GFR may be an effective strategy to prevent kidney disease and cardiovascular complications.
Methods: We studied in the sanitary area 2 of Madrid community a population of 64481 people older than 14 years, (48664 younger than 65 and 15.817 older than 65) corresponding to 3 primary care centres.

Primary care database records were used to identify age, gender and clinical features of people who had creatinina measurement, between April 2004 and April 2006, performed in the hospital area laboratory as outpatients. The laboratory used the modified kinetic Jaffe assay with coefficient of variation of <3%. GFR was calculated by the abbreviated MDRD formula GFR ml/min/1.73 (Manjunath Curr Opin Nephrol Hypertens 2001).
Results: We found 33.662 creatinina test performed in 19059 different adults or 29% of the population. The proportion of the population with renal testing increased with age; it was 47.2% of those older than 65yr and 23.8% of patients younger.
10.093 patients, 15.2% of the entire population and 52.8% of those with test performed had Ccr between 60 and 90ml/m; 2824, 4.25% of population and 11.8% of tested had Ccr <60. Considering older than 65yr we found 28% of population and 59.4% of those with test performed with Ccr 60-90ml/m; 12.2% (25.6%) with Ccr <60.
The incidence of cardiovascular complications was higher in the group with Ccr<60: 65.1%HTA, 15.4% diabetics, 11.5 ischemic cardiopathy, 7.4% stroke, V.S 28.8%, 8.8%, 4.02%,2.2% in group with Ccr >60 ($p<0.05$).
Conclusions: Identifying individuals with reduced a GFR using laboratory database and Primary Healthcare Information System is a promising strategy to prevent kidney disease and cardiovascular complications.

FP209 MULTIFOCAL FUNGAL INFECTIONS AT DIFFERENT STAGES OF CHRONIC KIDNEY DISEASE

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Introduction and Aims: Patients with chronic kidney disease are believed to be much more susceptible to fungal infections than healthy individuals due to coexisting immunity disorders, frequent invasive diagnostic/therapeutic procedures and the wide use of broad-spectrum antibacterial agents for bacterial infections. The aim of the study was to evaluate prevalence of fungi and its species in patients with chronic kidney disease.
Methods: In this cross-sectional study, 50 patients with chronic renal disease (22 M and 28 F; mean age 56.6±2.12 yrs) with GFR <60 ml/min/m^2, not yet on dialysis (CKD), 56 patients (35 M and 21 F; mean age 55.4±3.8 yrs) on chronic haemodialysis (HD) and 30 healthy (18 M and 12 F; mean age 49.1±5.6 yrs) subjects without history of kidney disease were included. All patients did not show any clinical signs of fungal infections and were not treated with antibacterial agents for at least 4 weeks. Specimens for mycological examinations were taken from the oral cavity, faeces and urine (if available). In order to evaluate morphological and biochemical features of fungi the following methods were applied: 1. macrocultures in solid Sabouraud's medium, 2. direct microscopic slides and microcultures in different media, 3. API 20 C AUX test.
Results: 385 samples for the mycological examinations were collected and 161 fungal strains were isolated from the samples. The fungi were isolated from 54 HD patients (96.4%), 32 CKD (64.0%) and 19 (63.3%) healthy subjects; the most frequently from oral cavity in HD (88.9%) and CKD patients (84.4%) and from faeces in healthy subjects (53.3%). The fungi in urine were detected in 4 HD patients (from all 33 samples collected from patients with residual diuresis), 10 CKD and none in healthy subjects. Monofocal mycosis was found in 29 HD (51.8%), 14 CKD (43.7%) and 11 healthy subjects (36.6%), and bifocal in 24 (44.4%), 15 (30.0%) and 8 (26.6%) subjects, respectively. The pathogens were identified the most frequently from ontocenoses of the oral cavity and the rectum. Trifocal infections (in oral cavity, rectum and urinary tract) were found in only 1 HD and 4 CKD patients. The fungi were isolated from 64.3% CKD patients with 30 >GFR <60, 60.0% with 15 > GFR <30 and 83.3% with GFR <15 ml/min/m^2 ($p<0.001$). From all isolated strains 156 belonged to the genus *Candida*, 2 to the genus *Saccharomyces* and the remaining 2 to the genera: *Cryptococcus* and *Geotrichum*. *Candida albicans* was the most frequently isolated pathogen from all groups of patients.
Conclusions: Prevalence of fungal infection in non dialysis patients with chronic kidney diseases is similar to healthy subjects and increases in patients with more advanced CKD and those on HD. Fungal infections in haemodialysis patients are common and frequently more than monofocal.

FP210 RENAL INSUFFICIENCY AS A RISK FACTOR FOR DEVELOPMENT OF ADVERSE DRUG REACTIONS

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Introduction and Aims: Adverse drug reactions (ADRs) cause significant patient morbidity, mortality, and cost. Patients with chronic renal insufficiency (CRI), including hemodialysis patients are at high risk for ADRs and drug-drug interactions. The frequency of ADRs increases with number of medications need, the age of the patient, the number of comorbid conditions and the degree of renal dysfunction.
A 3-month prospective pharmacovogilance study was managed in Clinic of Nephrology and Hemodialysis among hospitalized patients to: (i) detect ADRs as cause of admissions and manifested during hospital stay; (ii) study characteristics of ADRs; (iii) assess the importance of CRI as a risk factor.
Methods: All suspected ADRs were collected by clinical pharmacologist and nephrologists via everyday patient examination, review the patient charts, all medicationsand laboratory measurements. The prevalence of ADR, types (Edwards&Aronson classification), causality (Naranjo index) and severity of ADR, length of hospital stay, avoidability, and outcome were evaluated.
Results: Patients were 58,0 (range 18-81) years old, had 4,8±2,0 comorbid conditions, were taking 5,93±1,97 (range 2- 14) medications, 52,47% had renal insufficiency. Among 223 inpatients, we found 17,04% with ADR; incidence – 197,3‰. 70,45% were determined to be Type A, 25% - Type B and 2,27% - Type C and D according to Edwards&Aronson. 55,16% (n=21) of patients with ADR had CRI (4 patients – I degree; 7 – II degree; 10 – III degree). Five severe ADRs were detected; all were occurred in patients with CRI; 4 in hemodialysis patients.
Conclusions: The number of ADRs experienced by patients with renal insufficiency was not significantly greater than by patients without CRI, but ADRs were more severe. Most ADRs were predictable and possibly avoidable, considering the degree of CRI and co-morbidity; pharmacokinetics and nephrotoxicity of drugs; limitation of polypharmacy.

FP211 HEMODIALYSIS PATIENTS: CORONARY CALCIUM DEPOSITS AND PTH SERUM LEVELS

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Introduction and Aims: Decreased bone turnover, as in adynamic bone disease (ABD), is considered a risk factor of vascular calcifications (London G et al 2004), due to decreased buffering of calcium-phosphate and consequent extraskeletal mineral overload.
Methods: Bone turnover in CKD is strictly linked to PTH serum levels. In our experience, in the PTH range 0 to 150, 50% of patients (pts) have ABD and 40% have a normal bone turnover, while all patients with PTH >500 pg/ml have increased bone turnover. This study has been carried out in 197 pts on HD, mean age 61±12 years, M/F 1070/90, subjected to Multislice CT for evaluation of coronary calcifications. Pts were divided in groups of increasing intact PTH serum levels: A, 0-150 pg/ml (24 pts); B, 150-300 (33 pts); C, 300-600 (40 pts) and D, > 600 pg/ml (38 pts). The groups were different for HD age ($p<0.02$), serum phosphate ($p<0.001$), CaxP ($p<0.001$).
Results: There was no difference in serum CRP and Fetuin-A among the groups. Average (±SD) Agatston score values of coronaries were: group A, 842.14±1210, B, 896.82±1085; C, 1405.37±1950; D, 2170.46±3307, with $p<0.05$ (ANOVA). In a multivariate regression analysis with coronary score as dependent variable, age ($p<0.0001$), HD age ($p<0.005$) and PTH ($p<0.001$) were independent significant risk factors. In conclusion iPTH serum levels 0-150, consistent with low to normal bone turnover, are associated to lower coronary score values. More severe coronary calcification scores are found in higher PTH groups.

Conclusions: Together with other known variables, PTH is an independent risk factor of coronary calcifications.

FP212 NATIONAL RENAL HEALTHCARE PROGRAM IN URUGUAY

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Introduction and Aims: Uruguay is a developing country with an established program (PR) for renal replacement therapy (RRT) for all patients (Pt) with end stage renal disease (ESRD) since 1980 (incidence: 149 pmp in 2005). A Pilot PR targeted to the Public assistance population of Montevideo was tried out supported by the Health Ministry and the National Fund of Resources, to guide the feasibility of a National Renal Healthcare Program (NRHP).
Methods: Improve Renal Healthcare (RH) in the entire population (POP) by the implementation of a NRHP for public and private assistance system by steps.
Specific Objectives:
1. Promote education for RH and healthy lifestyles in the POP
2. Integrate RH into the first level of assistance to promote early detection of CKD and set optimal timing of referral
3. Optimize Pt care in all stages to prevent or delay progression of CKD.
The expected CKD prevalence for people aged 20 or older (extrapolated from US data and adjusted for Uruguayan ESRD prevalence) is 6.7%.
Methods. The planned activities were to:
1) Inform the POP about healthy lifestyles and risk factors, through Primary Health Centers (PHC) teams, and massive diffusion media.
2) Integrate the RH in the First Level of assistance: a) designate a nephrologist (ND) to attend 2 hours a week for each 10000 POP aged 20 years and over. The Pt are referred by primary-care physicians (PCPs) or directly from the laboratory; b) Train the PCPs, dietitians and nurses on prevention and detection of at risk POP through education courses and guidelines; c) Plan the ND visits in a reference counter-reference system, depending on CKD stage, and d) Provide the renoprotective drugs.
3) Keep a longitudinal Registry of Pt with eGFR $<$ 60 ml/min/1.73m^2, proteinuria $>$300 mg/day or microalbuminuria $>$30 mg/day in diabetics
4) Reduce drop out with an electronic alarm that informs when a Pt miss an appointment.
5) Derive Stage 4 Pt to a Pre-dialysis Clinic, staffed by a formal multidisciplinary team (ND, Psychiatrist, dietitians, social worker, vascular surgery and nurses) committed to educate, give social and psychological support, and indicate the timely creation of the access for the selected dialysis modality.
6) Sign a contract of agreement between the NFR and the private and puplic healthcare institutions (HCI) progressively. For achieving comparable results it includes the implementation of the standardization of serum creatinine assay in each HCI with the Committee for Standardization and Quality Control (by calibration to an isotope dilution mass spectrometry (IDMS) reference method.
Results: The PR has been evaluated according to Structure indicators (IN) (hours of ND assigned to the target POP); Process IN (average number of new P per month); and Results IN (prevalence of CKD, P distribution by sex, age, stage and etiology, quality of care). The PR impact is measured by GFR changes, ESRD rate, and mortality rate.
Conclusions: The strategic framework of the NRHP has a continuous approach across primary, secondary and tertiary levels of prevention. Its feasibility has been proven by a pilot PR that now allowed the generalization of a NHRP in Uruguay.

Clinical studies in CKD

FP214 ESTIMATION OF URINARY MONOCYTE CHEMOATTRACTANT PROTEIN-1 (MCP-1) AS A MARKER OF RENAL INJURY IN TYPE II DIABETES MELLITUS

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Introduction and Aims: Diabetic nephropathy (DN) is the leading cause of end stage renal disease in western world. Increased number of interstitial macrophages has been observed in biopsies from patients with DN. Monocyte chemoattractant protein-1 (MCP-1) is the strongest known chemotactic fact for monocytes and is upregulated in DN. We examined urinary level of MCP-1 in type 2 DM patients to assess the possible correlation between its level and the parameters of renal injury.
Methods: Urinary MCP-1 level was assessed in 75 patients with type 2 DM (25 with & 25 without microalbuminuria and 25 with macroalbuminuria and renal impairment) and compared with matched healthy control subjects. HBA1c and estimated glomerular filtration rate derived from MDRD equation were examined in the study groups in relation to the urinary MCP-1.
Results: Urinary MCP-1 level was significantly higher in patients with micro and macroalbuminuria (167.41$\pm$50.23 and 630.87$\pm$318.10 ng/g creatinine respectively) as compared with normoalbuminuric patients and healthy controls (63.85$\pm$21.15 and 61.50$\pm$24.81 ng/g creatinine, $P<0.05$). MCP-1 correlated positively with urine albumin excretion rate (UAE) ($r=0.75$, $P<0.05$), HBA1c ($r=0.55$, $P<0.05$) and inversely with GFR ($r=-0.60$, $P<0.05$).
Conclusions: The study findings suggest that hyperglycemia is associated with increased urinary levels of MCP-1 that is closely linked to renal damage as reflected by proteinuria and GFR levels. Collectively, these findings suggest that MCP-1 is involved in the pathogenesis of diabetic nephropathy throughout its variable stages.

FP215 VALGANCICLOVIR PROPHYLAXIS FOR 6 MONTHS PREVENTS CMV-INDUCED DISEASE IN 96% OF KIDNEY TRANSPLANT RECIPIENTS

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Introduction and Aims: The benefits of CMV prophylaxis following kidney transplantation (Tx) are well established. However, it is not clear how long this prophylaxis must be given and whether should be applied universally or to selected patients (pts). Our objectives were to compare the occurrence and impact of CMV disease in 3 consecutive eras in pts receiving the same immunosuppressive regimen and transplanted and followed in the same institution by the same medical team.
Methods: 799 adult kidney Tx pts were selected since 1996 at the time of MMF was introduced in our unit. Period 1 (1996-1998) included 325 pts (80% primary Tx); no prophylaxis against CMV was given. Period 2 (1999-2004) included 323 pts (59% primary Tx); Valacyclovir was given for 6 months to all pts excepted D-/R-. Period 3 (2005-ongoing) included 149 pts (84% primary Tx); Valganciclovir was given for 6 months to all pts excepted D-/R-. All pts received induction with either ATG or anti-CD25 moAb, MMF, CNI and a steroid taper regimen (withdrawal at 2 months). CMV D/R serological status was not different among the 3 periods.
Results: The incidence of CMV disease was 27% in pts without any prophylaxis, 11% with valacyclovir ($p<0.0001$) and 4% with valganciclovir ($p<0.0001$). The difference between valacyclovir and valgancyclovir was also statistically different ($p<0.02$). Onset of the disease significantly changed from 1.9 months in the absence of prophylaxis to 3.6 months with valacyclovir and 8.3 months with valgancicloir ($p<0.01$). CMV disease was similarly encountered in D+/R-, D-/R+ and D+/R+ pts. No case of CMV disease was observed in valgancyclovir D-/R- pts (3% with valacyclovir). Patient survival was significantly lower in the era without prophylaxis as compared to pts receiving valacyclovir (11 vs 4% mortality; $p<0.003$). Graft loss was also lower (21 vs 9%; $p<0.001$). In the valganciclovir era, pts death was 3% ($p<0.01$ compared to non prophylaxis) and graft loss 3% ($p<0.001$